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# BROOKLYN BOTANIC GARDEN RECORD

EDITED BY

C. STUART GAGER

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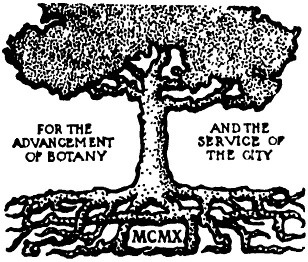
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AND THE SERVICE OF THE CITY
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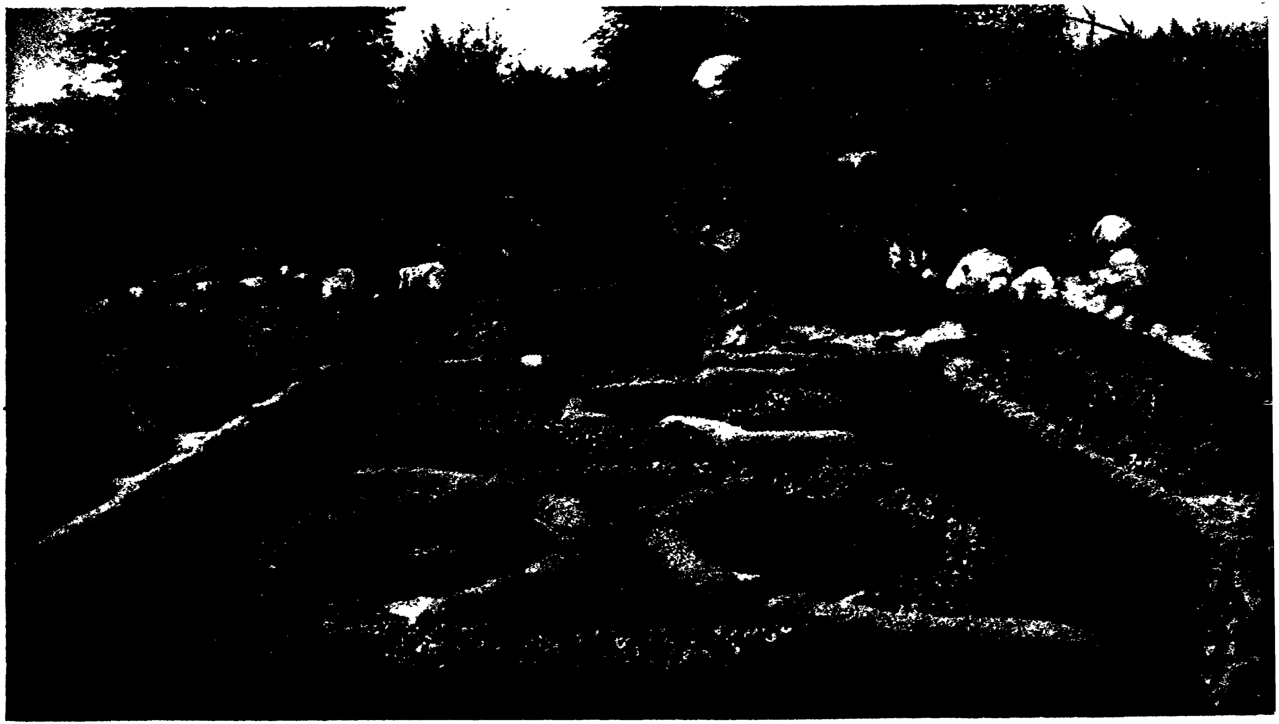

Fig. 1. Herb Garden of Brooklyn Botanic Garden. View facing west. Knot gardens of Sweet Violet (*Viola odorata*), Lavender Cotton (*Santolina*), Germander (*Teucrium Chamaedrys*), and Thyme (*Thymus vulgaris*), surrounded by Culinary and Medicinal plants. Cf. Fig. 3 (10,317).

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXXII JANUARY, 1943 NO. 1

# THE HERB GARDEN OF THE BROOKLYN BOTANIC GARDEN[1]

## GUIDE NO. 15

## PART I

## CULINARY HERBS: THEIR CULTURE, TRADITIONS, AND USE

By ELIZABETH REMSEN VAN BRUNT

*Honorary Curator of Culinary Herbs*

Importation data of the last ten years make clear the acute shortage of culinary as well as medicinal herbs resulting from war-time disruption of usual trade routes and destruction of production in many countries. The United States has been importing yearly an average of more than one million pounds of sage from Greece, Yugoslavia and Italy; 5,489,100 lbs. of caraway seed from Russia and the Netherlands; 140,552 lbs. of rosemary from Tunisia, France, and Spain, and more than six million pounds of poppy seed from Holland, Poland, etc. All this trade was wiped out in a few months of war, and these are but a few of the shortages we face. When that periodical of business and industry, *The Wall Street Journal*, first-pages herbs, as it did recently, we may admit their place in "Big Business." "Some herbs that add zest to food won't be handy by Thanksgiving," predicted the headline. "Not all spices will disappear. The popularity of herb gardens may ease the distress which otherwise would ensue. Persons alert to opportunity are developing substitutes . . . ," etc. As meat extenders

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[1] The illustration on front cover page represents a gardener setting out leeks. From Cresentius, *Opus ruralium commodorum*. Speier, 1495.

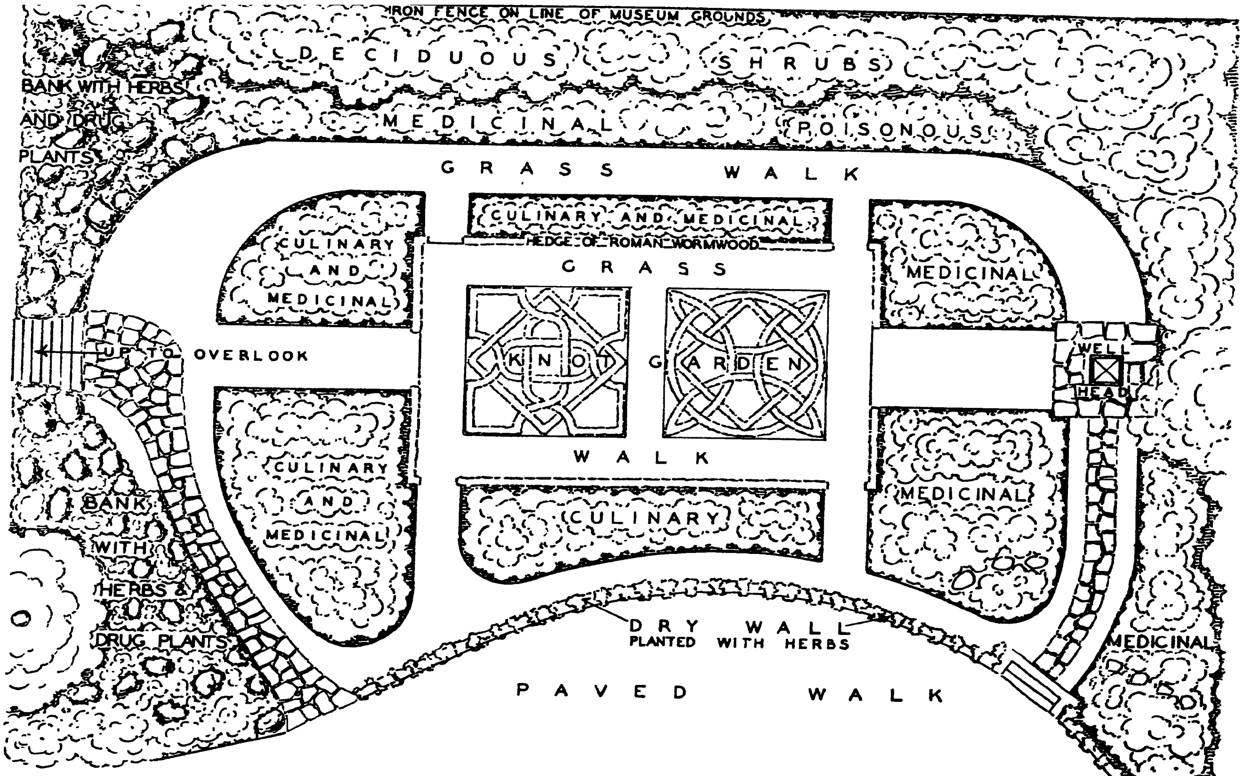

FIG. 2. Map of the Herb Garden, Brooklyn Botanic Garden (10,450).

large enough to harvest leaves, or in the case of fruit, until the seed is ripe enough to gather and dry.

Plants for kitchen use are best grown in rows or in small beds by themselves, and well labelled, as this will avoid confusion in seasoning. For some of us avoid the use of hyssop, as we would the Plague (or the skunk, of which its fragrance reminds us!), yet to the uninitiated the growth and leaves of hyssop may be easily confused with tarragon. Such planting makes easier cultivating, also. A safe rule for gathering herbs is to harvest when the plant is in bud (essential oil is diminished in flowering), and after the dew has dried—never on a rainy day. Dry the herbs in the shade and store them in tin or air-tight glass containers out of the light. An airy yet hot attic is practically perfect for drying most herbs. Lacking such, you may dry them in a warm oven or in a kitchen. Some may follow the old style of hanging sage, basil, and thyme in bunches, from the beams, where they may be quickly and easily reached for a pinch or two when the goose needs stuffing, or the tomatoes a bit of fragrance, and the clam chowder calls for a hint of thyme.

Whatever use is made of them, herbs should be handled with care, for like dynamite, they can prove deadly, in taste at least, if not used delicately. Some cooks prefer mixed herbs for seasoning, others like to experiment with simple, single flavors at a time, until it is found which combinations suit a family's palate best. Definite amounts are therefore usually hard to give in a recipe, but always, too little is better than too much.

## CULINARY HERB LIST

1. ALEHOOF (*Nepeta glechoma* or *N. hederacea*). Field balm is another name for this little creeping ivy used as a tonic and to flavor ale. Painters have been said to use a "concoction of Ground Ivy as a preventive of lead colic." It is a creeping perennial ground cover often found about old farmhouses where it has become naturalized.

2. ANGELICA (*Angelica Archangelica*). Both the flowering and leaf stalks may be cut while still green (in July) for crystallizing in syrup for decorative and flavoring use in confections. Angelica is used also to flavor gin, Muscatel wines, and liqueurs (e.g., Ver-

mouth, Chartreuse). The virtues of angelica, which are those of the "cordial" herbs, to comfort the heart, were said to have been revealed to a monk of the Grande Chartreuse in the Middle Ages by an angel, hence the name and its use as an ingredient of the famous liqueur, long a secret formula of the Carthusian Order.

Angelica is a native of Lapland and Iceland, south to the Alps, maturing the second year from seed, when it will remain perennial unless permitted to set seed. In that case it is biennial. It grows to 4 feet in moist rich soil and part shade, with umbelliferous heads of yellowish bloom. Wild angelica has white bloom and stalk tinged with purple.

3. ANISE (*Pimpinella Anisum*). The liqueur *anisette* and aniseed cookies are perhaps the best known uses for the fruit, which is also distilled to produce oil for flavoring and for perfuming toilet preparations. Anise tea makes one sleep—probably for the same reason that it is used for the baby's colic—anise being one of the famous "wind expellers" of herbal tradition. The United States has recently imported over 400,000 lbs. yearly, from Asia Minor, Greece, and Egypt, where anise is native.

The seeds of anise, an annual, mature in June or July about 6 weeks after sowing. The plants should be pulled up before the fruit ripens, as the seeds are easily lost, and dried on paper for several days, when they can be beaten to separate them.

4. BALM (*Melissa officinalis*). Sometimes called lemon balm as the fragrance is lemon-like, though more oily and not so refreshing as lemon verbena. It has the advantage, however, in being hardy in the vicinity of New York; lemon verbena is not. The fresh leaves and tops of balm make a tea (a handful infused in a pint of boiling water) to combat melancholy! . . . This statement has been tested and found to be true, by the way, although the Arabian proverb's promise, that "it makes the heart merry and joyful" was more than fulfilled, as the melancholy patient became, actually, hysterical, to such an extent was her heart comforted.

A sprig of balm is pleasant in iced tea. The leaves may be dried, slowly, for winter use in tea and for potpourri. It is lovely in bouquets.

Balm is a hardy perennial (a true *herb* since it dies to the root in winter), easily grown from seed. If cut back severely it will grow bushier. When established in favorable, light sandy soil, it grows weedily and self-sows all about, so that one may have charming scalloped-leaved plants to give to friends.

5. BASIL (*Ocimum Basilicum*). Sweet basil has always been associated with the fair sex, and tradition has it that it will flourish if stroked by a beautiful woman, in passing. A boy in Italy, going to meet his sweetheart, wears a sprig of it behind his ear; a common name for basil being *"Baccia, Nicola"* (Kiss-me-Nichola). Among the Hindus, a variety of basil, *tulasi*, is sacred to Vishnu, and planted before dwellings to protect the family from misfortune. Leaves of it are used in burial ceremonies, signifying immortality. as tansy did in early Colonial days in America. Contrarily, there is a saying that basil must be sown with curses, if it is to flourish, and the French idiomatic phrase, *semer le basilic* (to sow basil), means "to slander." It was one of the four "cordial" herbs, and its use in salads and tomato juice definitely does raise one's spirits, for it has a special affinity of taste with tomatoes and makes a delicious blend with other greens in a mixed salad. The young tops are used fresh in summer and should be harvested for winter, just as the buds are about to blossom, and dried in moderate heat. It is delicious powdered on eggs lightly fried with bacon, also in scrambled eggs and omelets.

There are several varieties of basil, all with about the same fragrance of leaf: *Ocimum basilicum minimum*, which is a tiny-leaved, bushy, dwarf basil; lettuce-leaf basil, which has a large crinkled leaf; purple basil, an attractive color for a collection. Sweet basil and the varieties are all tender annuals, growing easily from seed sown out of doors in May, and the more it is cut the bushier it will grow. Basil should grow well in window boxes or pots indoors, either potted and brought in, or the seed sown in early fall indoors.

6. BEE BALM or OSWEGO TEA (*Monarda didyma*), as its name implies, is attractive to bees. The wild bergamot (*M. fistulosa*) has lavender, pink, or purplish flowers. True bee balm has scarlet flowers, and it is this plant which was used as a substitute for tea during the American Revolution; its aromatic leaves are still enjoyed by some. It was among herbs taken to church for sniffing. The dried leaves are good for nausea. This is not the source of

the Oil of Bergamot used in perfumes and toilet preparations, which is from the bergamot citron (*Citrus bergamia*), grown near the town of Bergamo, Italy.

All the various monardas are perennial; they can be root divided and seed freely. The *M. didyma* likes a bit of moisture; and if various colors are growing together the plants soon are hybridized by bees.

7. Borage (*Borago officinalis*). Another of the "cordial" herbs, little used today except for the cucumbery-flavored leaves in claret cup or punch. It is said to have been introduced into Europe from the Near East. Borage was steeped in the wine the Crusaders drank upon departing for the Crusades. The Latin couplet,

| | |
|---|---|
| *Ego borago* | Fortified with borage |
| *Gaudia semper ago,* | I always go with courage, |

attributing *courage* to this herb, explains its use by the Crusaders. We moderns may well revive its use! The leaves, although hairy, have been cooked as spinach. The intensely blue, star-like flowers may be separated from the corolla and floated in finger bowls or in fruit cup and drinks.

Borage is a biennial easily grown from seed. It does not transplant well because of its long taproot, but it will self-sow if soil and location are favorable. It grows to about 18 inches in height, and since the flowering tops droop, it looks best grown along the top of a wall or a bank, so that the blue and often pinkish blossoms may be seen.

8. Burnet (*Poterium Sanguisorba*) has delicately pinked, small compound leaves along each stem; these leaves are delicious in green salads, giving a faintly astringent cucumbery flavor. One can appreciate the old saying,

"The salad is neither good nor fair
If Pimpinella is not there."

Burnet was formerly called *Pimpinella Sanguisorba,* hence the rhyme.

It is perennial, grown easily from seed. The flowering stalks should be kept cut back to ensure a succession of fresh young leaves through the summer. It is not dried for winter use.

9. CALENDULA (*Calendula officinalis*). The Pot Marigold of Shakespeare's day was then used more in cooking than today. Its petals were used in puddings and soups. The Dutch have used it to give a rich color to butter and it may be used today with Nucoa and other butter substitutes. An antiseptic, healing ointment is made from *Calendula officinalis.*

Calendula is an annual, grown from seed in a cold frame, seedlings being set out when danger of frost is past, or sown where it is to grow. The single, dark centered variety is *C. officinalis,* having orange flowers.

10. CARAWAY (*Carum Carvi*) was considered by the Chinese to confer immortality. Perhaps the early Dutch sea captains brought back the use of the seeds from China, in the 17th Century, for the early colonists of New Amsterdam were fond of caraway seed cakes. The seeds lend a pleasant flavor, sprinkled on a baked apple or in an apple pie.

Caraway is a biennial, setting seed the second year from sowing, so one must not clear up the row the first fall. The foliage growth is much like a carrot.

11. CATNIP (*Nepeta Cataria*). Catnip tea, being used for backache in early Colonial days, it is interesting to hear that the latest cocktail being served at a smart New York men's club, has finely chopped catnip as an ingredient! Cats also appreciate it, an old rhyme being:

"If you set it, the cats will eat it;
If you sow it, the cats don't know it."

12. CHAMOMILE (*Anthemis nobilis*). The Roman chamomile is perennial, growing matlike, close to the ground. It can be grown from seed or by division of the old plant. The whole plant is aromatic, as well as the blossoms.

*Matricaria Chamomilla,* the German Chamomile, is an annual, growing to 18–24 inches. It may be sown in early spring and again later for a second crop.

It is *Matricaria* which is used for herb teas. It is not so aromatic as *Anthemis,* but perhaps more soothing. *Matricaria* is the only chamomile recognized as officinal (official) in this country, although some prefer the Roman chamomile. Flowers of either species are used in hair-rinse for blondes, or to act as tonic for the scalp. It makes the hair soft and lustrous. There are other industrial uses for the essential oil.

13. CHERVIL (*Anthriscus Cerefolium*) is a delicate, parsley-like, annual herb with a slight anise flavor. It is delicious in salads, and *chervil pluchés* are indispensable in elaborate French cookery, for soups.

Chervil grows easily from seed if the ground is moist, fertile, and finely pulverized. It requires shade. Leaves may be picked all summer, but it is not used dried.

14. CHIVES (*Allium Schoenoprasum*). A young and delicate cousin of the onion, chives is used when onion flavor is desirable in soups, salads, eggs, etc. The leaves must be finely cut for use rather than chopped, as they are tubular.

Chives grows from seed sown early, and will increase itself by reseeding as well as by bulblets. It should be cut back or used regularly to produce young tender shoots through the summer, and may be potted for winter use.

15. CLARY (*Salvia Sclarea*), not often used today in cooking, was formerly grown for its seeds, a valued eye lotion being made from them. The leaves may be dipped in batter, and fried in deep fat. It has a rather disagreeable, strong fragrance and flavor, but the plants are lovely in a border with delphinium. The leaves make a massed clump of pebbled gray-green texture, and the lavender and bluish blooms grow in branched spikes several feet tall. It is biennial and readily self-sows.

16. CORIANDER (*Coriandrum sativum*). We all remember the little pink-and-white sugared balls tasting of perfume, as a confection when we were very young. Oil of coriander is used in liqueurs, perfumes, and other preparations. It is an ingredient of curry powder. Over 1,800,000 lbs. were imported into the U. S. annually, before the war, mostly from Hungary and Morocco.

Seeds of this annual may be sown in May. It should be well cultivated by hand, and the seedlings thinned to 6 inches apart. Seed may be harvested in August.

17. COSTMARY (*Chrysanthemum Balsamita*) is also called Alecost, from its use in flavoring ale. It is laid in linen cupboards for the fragrance, and keeps moths from clothes. A leaf used as

a bookmark in Colonial days in America gave it the name of Bible Leaf.

It is a strong-growing perennial whose clumps increase in size rapidly, so it may be root-divided. It grows to 3 feet or more.

18. CUMIN (*Cuminum Cyminum*) tastes slightly of caraway, for which it is sometimes used as adulterant. The seed is the source of oil, of which we have imported annually as much as 74,000 lbs. from France, Algiers and vicinity. It flavors kümmel and is an ingredient of curry powder.

Cumin is an annual, maturing from seed in about six weeks.

19. DILL (*Anethum graveolens*) is used principally for pickles and to flavor fish sauces, for which both the leaves, flowers, and seeds may be used. It has been used medicinally and for flavoring since Pliny's time.

Sow in spring, as it is an annual, and it will mature enough for use in about eight weeks. It is best thinned where it is sown, as it does not transplant easily.

20. ELDER (*Sambucus canadensis*). The elder tree should be a part of every herb garden as all herbs, according to legend, are under the protection of the Elder Tree Mother. Not only for its legends, but for its use in the house, must an elder be grown. Its "blow" makes a more delicate wine, even, than its berries, which are famous for that purpose. And the umbels of creamy blossoms make a delicious fritter. Cut at the very height of bloom, soak in brandy with a stick of cinnamon for an hour. Dip each cluster (coarse stem removed) into rich egg batter and drop in deep hot fat, frying until a light brown. Drain on brown paper, serve sprinkled with powdered sugar and orange or lemon juice.

A very good bleaching cream for gardening hands is made by gently boiling for an hour as many handfuls of elder blossoms as two pounds of melted hog's grease will cover. Strain through muslin into small containers. Cover with paraffin, as with jelly, to keep sweet. Elder flower and peppermint tea is a pleasant combination. Elders are woody shrubs and may be grown from root division.

21. FENNEL (*Foeniculum vulgare*) is similar to dill in growth, but is perennial and taller, growing to four feet. It is used as dill is used, with fish, and to flavor medicines and liqueurs. It acts as

a digestive, and is thought to reduce weight. It grows easily from seed, sown early in spring. Both the seed and the flowering tops are used.

*Foeniculum dulce* is Florence fennel or *finnochio*, which is an annual and grown like celery; that is, earthed up for a fortnight to blanch the bulbous leafstalk, which is then eaten raw or boiled.

Fennel tops were often added to the "meetin" bouquets carried to church in Colonial days—perhaps something to nibble as well as to smell was to be desired, during the three-hour sermons!

22. SWEET FLAG (*Acorus Calamus*). The root of the sweet flag, growing in swampy places, is dried and candied, to be used as a breath-sweetener and also a digestive. Before the days of "Life Savers" slivers of candied calamus root were often carried in the pocket for the same use. Can be increased by root division.

23. SWEET GERANIUM (*Pelargonium*). The most useful of these are: the rose geranium (*P. graveolens*), which is deliciously rose scented; a leaf floated in a glass of apple jelly flavors it with rose, and the leaves may be dried for potpourri; *P. crispum*, which has a tiny leaf attractive for sweet bouquets; *P. tomentosum*, peppermint geranium (the softest, most velvety, and fragrant of peppermint) is beautiful in flower arrangements and makes a delicious addition to lemon jelly (gelatine).

These pelargoniums may all be increased by slips taken in spring or fall, and make luxuriant growth if put in a sunny spot in the garden for the summer, but should be potted for the house in August. Old woody plants are best discarded and new ones started from slips, for the winter and for next summer's garden.

24. GERMANDER (*Teucrium Chamaedrys*) makes a practically evergreen border for herb garden beds or for the lines in Elizabethan "knots," and is hardier than box for that purpose. It may discolor and die to the ground before spring, but will come up from the roots. It can be sheared if desired. It is a woody shrub and can be divided with a sharp knife for propagating.

25. HOREHOUND (*Marrubium vulgare*). "Syrup made from the green fresh leaves of horehound and sugar is a most singular remedy against the cough and wheezing of the lungs."—*T. Tryon, 1692.* Horehound candy for coughs is made every year by the Girl Scouts in Boston, and sold for their Benefit. It is made by

boiling sugar to a feather height, adding a concentrated infusion of horehound and boiling again until the same height. Stir until it grows thick, add a spoonful of butter, pour on a buttered dish and when cool enough cut in squares.

Horehound is a hardy perennial, dying to the ground in winter. It may be grown from seed or by division.

26. HORSERADISH (*Cochlearia Armoracia*). The root is grated and used as a condiment with fish, meats, etc.; also with cottage cheese as an appetizer. Rootlets should be cut from the main old root in October and stored in sand in a dry cool place until early spring when they may be planted in moist sandy soil and grown until dug for use.

27. HYSSOP (*Hyssopus officinalis*). Its rather skunk-like odor prevents our modern taste from enjoying hyssop in cooking, but its growth and purple spikes of bloom make it valuable for the herbaceous border. It grows about two feet high and will bloom a second time if cut back after the first. It grows from seed or division. The identity of the hyssop mentioned in the Bible has not been proven; it may not be this.

28. LAVENDER (*Lavandula vera*) is used mostly as a perfume herb although the oil is also used in the paint industry in the making of certain lacquers. The scent of lavender is a stimulant and good for head weakness. The United States has imported 25,000 lbs. of the flowers annually from France, Spain, and the United Kingdom. The dried lavender of commerce is the buds (harvest when first flower opens), cut and dried on the stems, then stripped off and stored in air tight containers. A mixture of lavender and dried lemon verbena leaves in sheer muslin makes a delicious combination for pillow bags or for the linen cupboard.

Lavender can be grown from seed, but is simpler from cuttings taken of green wood only, about two to three inches long, in early spring, and kept moist and shaded in light soil either in a cold frame or sheltered spot. Old shrubby plants should be cut back with discrimination, in spring, to encourage bushy growth and increase the bloom. Lavender should be grown on well dug land, sunny and sloping to the south, protected from prevailing winds and well drained. Oyster shells pulverized, and eggshells dug into the ground about the plants, increase the calcareous content with good results.

29. LAVENDER COTTON (*Santolina Chamaecyparissus*) is used mainly for bordering beds and formal gardens, such as the knot gardens of Elizabethan days. It is slightly aromatic. It can be increased by division, being perennial.

30. LOVAGE (*Levisticum officinalis*). Several herb growers have said that lovage has grown to be their favorite of all the herb garden, for use in food. It is blanched like celery and also the leaves are used in salad. It has a pleasantly aromatic flavor. The seeds are used for flavoring candy.

Sow seeds in summer and transplant seedlings in early fall. Lovage needs a rich moist soil.

31. SWEET MARJORAM (*Origanum Majorana*) smells like all the holidays rolled into one—Thanksgiving, Christmas, and New Year's Day! It is the perfect seasoning for chicken and turkey stuffing and is pleasant cooked with mushrooms. The oil from the plant has been imported for use in perfumery and other toilet preparations, and in medicines.

It is an annual grown from seed. Keep seedlings shaded until strong, then the plants need a sunny exposure. They will rot if the season is too rainy.

*Origanum vulgare* (Pot marjoram) is perennial, taller, and more spreading than sweet marjoram. It is not so aromatic when fresh, but increases in fragrance when dried. It grows very weedy and needs to be divided every two or three years.

MINTS. See Peppermint, Spearmint, etc.

OSWEGO TEA. See Bee Balm.

32. PARSLEY (*Petroselinum crispum* or *Apium hortense*). Parsley is too valuable in vitamin C and iron to be thrown out after garnishing our meat platters! Eaten fresh, chopped as little as possible, it retains most of its mineral and vitamin content. Parsley soup, parsley tea, and parsley sauce are all pleasant ways of using it. It makes a beautiful compact border in the garden and stays green until after frost. It is attractive as an accent in arrangements or as an edge to a formal bouquet. The Greek saying "we are only at the parsley and the rue," when an important undertaking was just planned, came from the use of the two plants as

border material in gardens of antiquity. It was also fed to chariot horses in Greece and heroes were crowned with it after battles, as winners were after their games. As has been aptly remarked, "It once crowned man, it now crowns his roasts!"

The failure of parsley to germinate easily has given rise to much legend. It is reported that it goes to the Devil, 7 times and back, before germination. In that case the custom of soaking the seed in hot water for several hours or even overnight, before sowing, evidently starts it on its way and shortens the trips. Thomas Hyll, in 1577, gave this advice:

"To make the plants appear more quickly, steep the seeds in vinegar. Strew the bed with ashes of bean water and the best aqua vitae, then cover with a piece of woolen cloth and the plants will appear in an hour. . . . Take off the cloth suddenly that they may shoot up the higher, to the wonder of all beholders."

The tradition that a person transplanting parsley will be visited by misfortune probably arises from the fact that it does not transplant well because of its tap root and should be sown where it is to grow and thinned. Plants will live over the winter if cut back regularly and not allowed to seed, and may be used fresh, into the winter, if covered lightly.

33. PEPPERMINT (*Mentha piperita*). There have been importations to the United States of 79,851 pounds annually, of Oil Menthol, from Japan and China. Much acreage is devoted to peppermint, however, in Michigan, and the higher labor costs of production and distillation may be met by cheaper methods of harvesting, etc. Many mints probably are hybrids of *Mentha spicata*, and have the same general properties. *M. piperita* has a higher menthol content, making its pungence more delicate because more volatile.

Mint stimulates the brain, said Pliny, therefore students should wear a crown of mint while studying. He also advised sprinkling the room with vervain water, to make the guests merry at a dinner party. If one did so, and rubbed the table with mint leaves, serving tomato juice or a salad in which basil was an ingredient, what need for cocktails! Mint prevents milk from curdling and aids digestion. Peppermint is used for a flavoring in food and confections as well as in medicinal preparations.

All the mints grow easily from root runners, which can be taken at any time; or a stem usually roots in water. They are perennial, liking moisture and some shade to be at their best, when they will overrun the place. *M. requieni,* the tiny Corsican mint, *M. citrata,* and *M. rotundifolia* are most like peppermint in their various fragrances.

34. ROSEMARY (*Rosmarinus officinalis*). When prisoners were brought into court from Newgate Prison, at the time of the Great Plague in London, bunches of aromatic herbs with antiseptic and preventive qualities against infection were carried in and hung or held by court attendants between the prisoners and the judge, rosemary and rue being prominent in the collection. There is a sausage called "the Happy Sausage" made in Poland, in which the predominant seasoning is rosemary. It has been called the "Herb of Remembrance" and of loyalty, and played a part in funeral ceremonies in several countries. "The very smell will keep thee youngly," ran an ancient line. It was an ingredient of the famous Hungary Water, said to have cured Queen Elizabeth, of Hungary, of paralysis. It is most effective used sparingly in soups, meat pies, stews, and with eggs. Its pungence, if freshly dried, is too powerful to suit some tastes, so as with all use of herbs, your taste, rather than your conscience, must be your guide!

Rosemary is a tender shrubby plant which must be kept in a cool greenhouse over the winter in this climate (above New York). It can be propagated by cuttings taken in spring. The green shoots are the part used and dried, and care must be taken to cut before they turn woody as then the pungence is too reminiscent of turpentine.

35. RUE (*Ruta graveolens*) was another infection-resistant included in the "Flowers for the Judge" of the 17th century, still carried in the Courts of Assizes in England. Flies are said to be repelled by it, no serpent goes near it; and, curiously, sweet basil which, tradition has it, is sacred to serpents, does not flourish near rue. This is a rule of the old herbalists which has been found to have at least a grain of truth! Rue was an ingredient of the famous "Vinegar of the Four Thieves," and under its protection men entered safely and robbed houses of those lying sick of the plague in Marseilles. Next to wormwood, it is the bitterest herb

in the world, and to most of us has a slightly unpleasant, musty flavor. We have however used tiny young leaves on thin bread and butter, for tea; and some like a bit minced fine in chicken salad or chicken broth. Its two foot growth is graceful and shrubby if not allowed to go to seed, and the blue green of the maidenhair-like foilage is lovely both in the garden and in flower arrangements.

It is a shrubby perennial easily grown from seed or division. Cut to two inches in the early spring for thicker growth.

36. SAFFRON (*Crocus sativus*) is used to flavor and color certain dishes especially used by the Latin race. Over 3,000 lbs. have been imported annually into the United States from Spain, Italy, and France. Used since ancient days as a dye, the stigmas of these autumn-blooming crocuses must be pinched out with the fingernail and dried for use. Bouillabaise and saffron buns are colored and flavored with saffron and it is also used to some extent in medicine as a stimulant, for example, as a tea to "bring out" the measles on a small boy.

The corms should be planted in late spring or summer. Blooms appear in October. Approximately 60,000 stigmas are needed to make a pound of saffron, so a false saffron, Safflower or *Carthamus tinctorius*, is usually substituted for true saffron in cooking.

37. SAGE (*Salvia officinalis*) is an important seasoning herb for pork, and is also used as a meat preservative by the packers. It has a long record for preservation of human life as well, the couplet

"He who would live for aye
Must eat of sage in May."

bearing out the tradition of Old Robin Scarlet, who lived long enough to bury all the inhabitants of the cathedral town of Peterborough, England, twice over! For he attributed his long life to a diet of bread and butter and sage. A Swiss friend of the writer says that when he and his sister played in the garden, as children, their nurse had them rub their teeth with sage. "The toothbrush for cleanliness" she said, "the sage leaf for beauty." It is good with goose, turkey, and pork, partly for the flavor and partly for its digestive quality with fat meats. A leaf rolled in with the stuffing of "veal birds" gives just the perfect seasoning. Sage tea sweetened with honey is invaluable for sore throat. The Chinese drank it centuries ago. It is used in hair tonics.

Sage grows very easily from seed sown out of doors as soon as the ground can be worked. Sow thinly, about a foot and a half apart, in rows, so the seedlings need not be thinned. The plants will not set seed the first year, but can be harvested for leaves as soon as they become about a foot high, and several cuttings may be made through the season up to frost. Do not cut back, however, until spring, when the plants may be cut to two inches and the resulting cutting used as mulch between the rows. That saves weeding and moisture! Sage plants grow to an old age but the leaves grow smaller and less pungent if not given fertilizer.

38. SAVORY. Summer Savory (*Satureia hortensis*) has a more delicate and sweeter taste than winter savory (*S. montana*). The former, used in seasoning meats, soups, stews, and beans, is called *bohnekraut* in Germany. A sprig or two does give a delicious flavor to string beans, being boiled with them. It is pleasant in an omelet. Bees love it. It should be harvested for drying before it blooms. Summer savory is an annual. Winter savory is perennial, sharper and more biting in flavor. It can be used in seasoning about the same as summer savory. It was used as pepper is now used, before pepper was brought from the Indies. It is almost evergreen, but loses its flavor in winter, and should be cut to the ground in spring. It makes an attractive low (4–5 inches) border plant, and can be clipped for a formal edge, the clippings being used both fresh and dried.

39. SESAME (*Sesamum orientale*), native to the tropics, is imported in large quantities here for the use of the seeds in cakes, cookies, candies, and, in the South, for broth. The Chinese make seedcakes of them, and the oil is used in cooking, as olive oil. It also is used in making soap.

It can be grown from seed if sown in spring in a sunny spot, but is too tender for adequate growth (to fruiting) in this climate.

40. SORREL (*Rumex Acetosa* or *R. scutatus*). The variety of garden sorrel, *Oseille large de Bellevilé,* is the best to grow. It makes a thick clump of pale green, large, crinkled leaves that are most succulent and tender for salads and soups, particularly *Potage Germiny.* Sorrel may be well grown from seed and the thick

clumps will last for years if cut regularly, with the flowering stalks cut to the ground as they appear. Use the youngest, small leaves for salads and garnishing. The larger may be minced for soup. Wild sorrel has a tougher leaf and less pleasant flavor but may be used.

41. Jamaica Sorrel (*Hibiscus Sabdariffa*). A tropical plant, called "roselle," whose acid calyxes are used in making roselle jelly, tarts, and cooling drinks. Lemon juice can be added to the jelly, which is made from the juice of the roselles, to make a more tart flavor.

42. Southernwood (*Artemisia Abrotanum*) is not used today in cooking, but is indispensable in the herb garden to add atmosphere, fragrance, and stability of growth. Its ashes, mixed with old salad oil, were once thought to make hair grow where none ever grew before. It was called, variously, "Old Man," "Lad's Love," or "Maiden's Ruin," and "Appleringie" in Scotland, where the shrub was often used as a bleaching spot for fine handkerchiefs because of the pleasant fragrance imparted to the linen. It is often used in clothes closets as moth preventive, and hence called *garderobe* in France.

It is a woody shrub, propagated by slips in the spring or fall, or by root division at almost any time. It grows ragged and leggy if left without cutting back severely in spring. It is said to do well in town window boxes as it can stand the smoke of cities very well.

43. Spearmint (*Mentha spicata*) has practically the same properties as the other mints (see Peppermint) without the same volatile menthol content as *M. piperita*. It has a stronger, sharper taste and is the mint used for juleps, in mint sauce for lamb, and for iced tea. Curly mint (*M. spicata crispa*) makes a particularly delicious mint sauce; it has a rounder leaf than spearmint, with a little frilled edge. There are so many hybrid mints, they have become confused and called by various names in different localities. The very tall growing *M. niliaca* (*M. longifolia* x *rotundifolia*) is weedy but grand to use in summer arrangements, as the downy, silvery-green leaves are lovely in arrangements on hot summer days; they have a cool, frosty appearance, and mint in a room is said to cool the atmosphere.

44. TARRAGON (*Artemisia Dracunculus*) imparts a characteristic flavor to salads, *fines herbes,* and to tarragon vinegar. The brand *de Maille* is the most famous, for its fine *bouquet.* It is made correctly by steeping fresh young tops and leaves of tarragon in white wine vinegar, for three weeks, then straining off the vinegar into small bottles. Tarragon loses its value when dried, therefore it is only used fresh, or it can be bottled in vinegar and the pickled leaves used when needed.

Cuttings of tarragon may be taken in the spring, or the old plants divided and reset then. True tarragon does not set seed. Some say it does not tolerate other varieties of plants in the same bed!

45. TANSY (*Tanacetum vulgare*) has been said to have its name from *Athanasia* (immortality).[1] It was and is used to flavor puddings in Lent. A delicious modern counterpart of Samuel Pepys's tansy for Easter, is a vanilla soufflé colored a pale green with vegetable coloring, with a teaspoonful of finely chopped young tansy leaves added to the four-egg mixture before the well-beaten whites are folded in. Served with thick cream and powdered maple sugar, it may reconcile us to sugarless sweets and dispel the humors of winter agreeably. It is repellent to flies. It may be dried for winter tea, for rheumatism.

Tansy grows luxuriantly, to 3 or 4 feet, in any soil not too light and may be grown from seed or root division. It self-sows and if not given a fence-post or a corner to support it, throws its length to the ground. *Tanacetum crispum* is shorter and more compact in growth, more finely ferny as to leaf, and therefore more desirable.

46. THYME (*Thymus vulgaris*) has a reputation for imparting

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[1] "*Tanacetum;* possibly from Greek, *athanatos,* immortal, in allusion to the long-lived flowers." (Johnson and Macself, *Plant names simplified.* London, 1931.) "*Tanacetum,* Pliny. Formerly called also G[reek] *Athanasia,* immortality. Tanacetum is according to Linnaeus an altered form of Athanasia, but it seems a rather far-fetched derivation." (Alcock, Randal H., *Botanical names of English readers.* London, 1876.) "*Tansy,* French *athanasie,* now contracted to *tanacée* and *tanaisie . . . Tanacetum,* its systematic name, is properly a bed of tansy, and is a word of modern origin." (Prior, R. C. A., *On the popular names of British plants, being an explanation of the origin and meaning of the names of our indigenous and most commonly cultivated species.* London, 1870.) (Ed.)

courage, not only to those who eat but to those who wear it. It is perfect with chicken, turkey, and in omelets or scrambled eggs. It has always been associated with bouquets of herbs for soups and stews, and with jugged hare or rabbit stew. It is attractive to bees, and wild thyme honey is famous in some localities. Wild thyme (*T. serpyllum*), however, which makes springy mats of fragrance in a garden path or on a wild hillside, is not the thyme for cookery, as its leaves are stiff and wiry and it has not the sweetness of *T. vulgaris*.

There are several varieties of thyme, all of which can be root-divided. *T. vulgaris* grows easily from seed but, although a perennial, does not always survive the winter, especially if not in a well drained spot. It loses its leaves and the roots rot in a wet summer. It is more pungent dried than fresh, and should be cut as the buds are formed, before blooming. It should be dried hung up in bunches and the leaves stripped from the stems when thoroughly dry.

47. SWEET VIOLET (*Viola odorata*). Violets make a pleasant tea, efficacious, it has been said, for "skin trouble." In fact that advice coincides with the thought behind the old Irish admonition "Rub thy face with violets and goats' milk and there's not a prince in the world who will not follow thee." Both leaves and flowers are used. Honey of violets, conserve, and, by the Persians, violet wine, are all made from the violet flowers. They are steeped in vinegar to produce violet vinegar, and in alcohol for a scented rubbing lotion.

Sweet violets are perennial, and hardy near New York, except the double Russian ones and the Parma variety. They spread rapdily, and are easily divided. They are supposed to bloom best if grown under a hedge (shade and poor soil); but we have grown them in beds with roses, heavily manured, and getting full sun most of the day, and they have bloomed thickly and steadily from the first week of October, through November.

48. WINTERGREEN (*Gaultheria procumbens*). The red berries of wintergreen are spicy to taste. One comes upon them in the woods, growing in such acid soil and light woods as suit trailing arbutus. The wintergreen makes a good ground cover, 2–3 inches high. The leaves make a pleasant tea, formerly considered effi-

cacious in rheumatic fevers. Oil from the leaves is used for a perfume in toilet preparations. Candies are flavored with it. It is used as a rubbing oil for lumbago and rheumatic pains.

It grows best in acid, sandy soil, and increases by underground creeping stems, which root as they go. These stems can be divided for planting.

49. SWEET WOODRUFF (*Asperula odorata*) has the lovely French name *Belle étoile blanche*, which describes its bloom perfectly. It is the leaves, however, which are of value, and they are sweetest when dried, when they have the fragrance of new mown hay. Sprigs of *Waldmeister*, as it is called in Germany, are steeped in Rhine wine to make the May Bowl or May Drink, on May Day. It can be used in tea quite pleasantly.

Sweet Woodruff is perennial, growing as a charming ground cover, 3 to 4 inches high, under lilacs or any spring blooming shrub with which its tiny white stars seem in harmony. It can be divided any time after blooming, and will thicken and spread in either moist or fairly dry soil.

50. WORMWOOD (*Artemisia Absinthium*), the bitterest herb in the world, has a long and interesting history. Since Bible times it has been branded with its bitterness, in fact it was said to have sprung up in the track of the serpent writhing its way out of Eden. It is used in the making of *absinthe*, the continued use of which is said to destroy the brain. It is healthful, infused in wine, to prevent summer sickness. In the Middle Ages babies rubbed with wormwood before their fifteenth day were never to feel heat nor cold so long as they lived! Wormwood tonic was much used in Colonial America, the leaves and blossoms being dried for this purpose.

It thrives in full sun, spreads rapidly and can be divided. The silver grey leaves are a good foil for other plants and greener foliage. It grows to about three feet, and needs staking.

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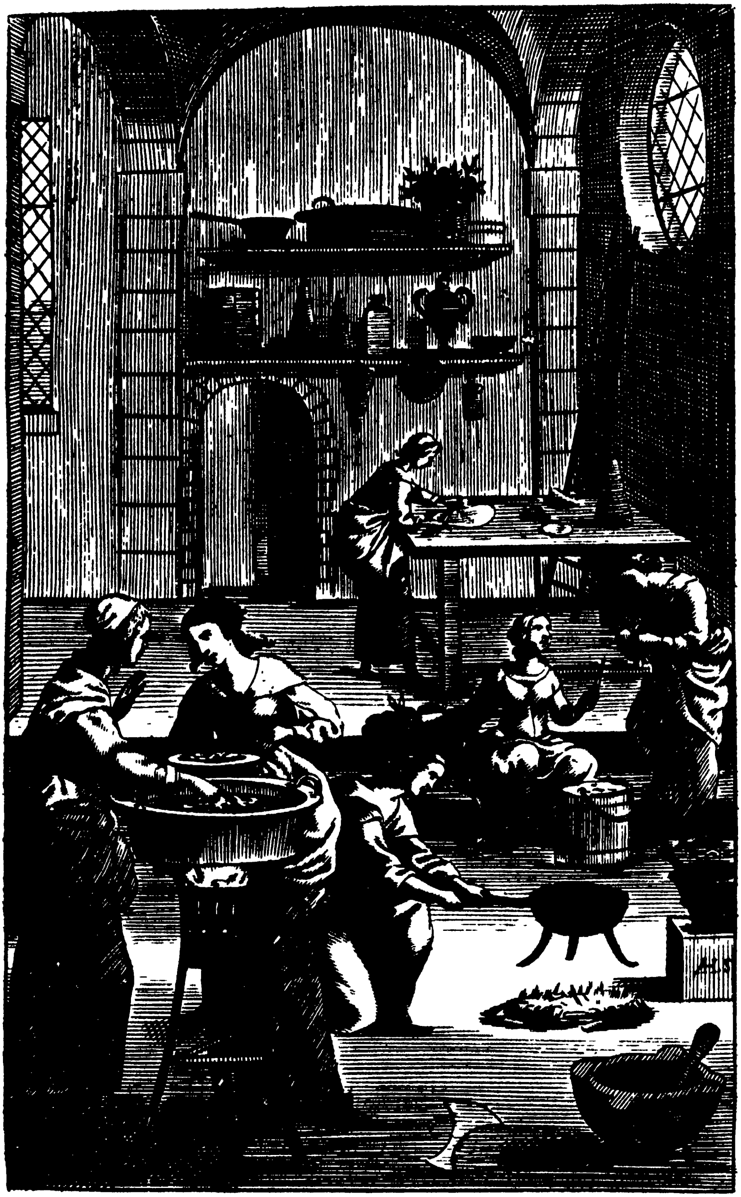

FIG. 3. Ladies engaged in preserving fruits. [*Evelyn, John*]. *The French Gardener.* London, John Crooke. 1658 (10,513).

## PART II

# COOKING WITH HERBS

### BY VIRGINIA RIDDLE SVENSON

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The following recipes give directions for using forty-five of the fifty culinary herbs growing in the Herb Garden of the Brooklyn Botanic Garden.

## BOUQUETS AND SUGGESTIONS

HERB BOUQUETS are bunches of fresh herbs or small muslin bags of dried ones selected to suit the type of food to be prepared.

*Fish-stock bouquet:* Medium sprig each of parsley, celery leaves, basil, fennel, dill, 1 bay leaf and 3 scallions, 3 cloves, 3 pepper corns.

*Meat-stock bouquet:* 2 sprigs parsley, stalk of celery with leaves, 1 large leek, sprig sweet marjoram, sprig thyme, 3 whole cloves.

*Tarragon* sprinkled over broiled mackerel, in tomato cocktail.

*Chervil* in scrambled eggs, creamy cheese mixtures.

*Sage* in baked beans or stewed tomatoes.

*Chives* in potato soup, salad dressings, cottage cheese.

*Mint* on broiled lamp chops, in green pea soup.

*Marjoram* in summer squash, spinach, or steak.

*Rosemary* with fresh peas, fricassees, and broilers.

*Sesame* seed in oatmeal cookies, frostings.

*Watercress* in mashed potato. Steamed for 10 minutes and served, like spinach, with lemon butter.

*Sweet basil* mixed with cottage cheese to stuff tomatoes.

*Dill* in lamb stew, boiled fish, boiled new potatoes.

*Horse-radish* in hot beef gravy.

*Hyssop* in fruit drinks.

*Lemon balm* in fresh coconut cake.

### *Onion Soup*

2 cups thinly sliced onion
2 tablespoons butter
3 cups canned consommé
3 tablespoons grated Parmesan cheese
1 cup water
Salt and pepper
6 rounds of toast

Sauté onion in butter until soft. Add liquid and seasoning. Simmer slowly for half hour. Place rounds of toast about 2 inches in diameter in soup tureen or plates; sprinkle thickly with cheese. Pour hot soup over toast and serve at once.

Flavor is improved if prepared early and let stand several hours. Serves 6.

### *Black Bean Soup*

2 cups canned black bean soup
2 cups beef bouillon or stock
2 tablespoons grated onion
Salt and pepper
½ teaspoon mustard

Simmer all together for half hour. Serve very hot with a slice of lemon or hard cooked egg placed carefully on top. The flavor of this soup is not harmed by reheating therefore it can be prepared early. Serve with corn twisters. Serves 6.

### *Cream of Mushroom Soup*

¼ pound mushrooms
4 tablespoons butter
2 tablespoons flour
2 cups milk, heated
1 cup chicken consommé
1 teaspoon chopped savory
1 cup cream
½ teaspoon salt
¼ teaspoon white pepper
1 teaspoon lemon juice

Wash and chop mushrooms; sauté in butter 5 minutes. Stir in flour. When well blended add hot milk, consommé, cream and seasonings. Cook until slightly thickened. Serve with dry melba toast. Serves 6.

### *Bortsch*

- 2½ cups beet juice
- ½ cup chopped beets, cooked or raw
- 4 cups meat stock or canned bouillon
- 3 tablespoons chopped onion
- 2 teaspoons sugar
- ½ teaspoon salt
- Cayenne
- 4 tablespoons lemon juice
- Sour cream, whipped
- 2 teaspoons chopped fennel leaves

Cook beets, stock and onion together 30 minutes. Strain, or not and add seasoning. Serve very hot with sour cream. If desired add 1 cup of finely shredded cooked cabbage.

### *Squash Soup*

- 2 cups beef stock
- Soup bouquet
- 2 cups cooked, sieved summer squash
- 2 tablespoons butter
- Salt and pepper
- Speck of nutmeg

Simmer beef stock with a soup bouquet of parsley, thyme, sweet marjoram, savory, leek. Remove herbs and add squash and seasoning. Yield: 4 to 6 portions. Canned beef bouillon may be used diluted with squash liquor or water.

### *Plain Tomato Soup*

- 3 cups tomato juice
- 2 tb. onion, chopped.
- 1 piece bay leaf and
- 1 teaspoon chopped basil
- 6 pepper corns
- Salt, pepper, sugar
- 1 tablespoon butter
- Croûtons and garlic butter

Simmer all but the butter over a low flame for 10 minutes. Strain and season with salt, pepper and a little sugar. Add butter and reheat before serving. If the soup is too thin thicken by rubbing 2 tablespoons flour into the butter and stir into hot soup. Serve with croûtons sautéd in garlic butter. Serves 4.

### *Vichyssoise*

- 1½ lb. potatoes, sliced
- ½ lb. leeks, sliced
- 2 qts. chicken broth
- 1 tsp. or more curry powder
- Salt

Simmer the potatoes and leeks in the broth for 1½ to 2 hours. Rub through a fine sieve and add curry and salt. Serve hot or cold from a tureen. Serves 6–8. Note: Lamb or veal broth may be substituted for chicken broth with fair success. Also canned chicken consommé or bouillon could be used with equal limitations. If a very white soup is desired use only the white part of the leeks.

### *Bouillabaisse*

*"This Bouillabaisse a noble dish is—*
*"A sort of soup or broth or brew,*
*"Or hotchpotch of all sorts of fishes,*
*"That Greenwich never could outdo;*
*"Green herbs, red peppers, mussels, saffron,*
*"Soles, onions, garlic, roach, and dace:*
*"All these you eat at Terre's tavern,*
*"In that one dish of Bouillabaisse."*

Henry Makepeace Thackery (1811–1863)

3 lbs. fish
½ cup olive oil or other fat
1 doz. oysters
1 doz. shrimp or
1 cub lobster meat
2 tomatoes chopped
½ cup white wine (optional)
4 cups fish stock
Soup bouquet
Saffron, to taste
3 tb. lemon juice
2 leeks, sliced
2 medium onions, sliced
1 large carrot, sliced
½ cup pimento, sliced
2 cloves garlic (optional)
2 tb. minced parsley
Salt and pepper

Use flounder, whiting, sole, haddock or perch. Prepare stock by cooking skin and bones of fish with 1 qt. of water and a soup bouquet of parsley, celery leaves, bay leaf, basil, sage, fennel. Cook carrots, onion, garlic and leeks in oil until golden brown. Add fish cut in 3 inch pieces, tomato and stock. Simmer 20 minutes. Add shell fish, pimento, and saffron to taste. Season with salt, pepper, and lemon juice. Put toast in a deep dish, add bouillabaisse and sprinkle with parsley. Makes 8 to 10 generous servings.

### *Potage Germiny*

| | |
|---|---|
| 2 tablespoons butter | 4 egg yolks |
| a handful of fresh young sorrel | 1 cup cream |
| 1 qt. clear chicken broth or stock | Salt to taste |

Cook a handful of chopped sorrel leaves in butter. Do not brown! Heat 1 quart chicken stock, add slowly to sorrel mixture. In a separate dish beat the egg yolks and beat in the cream. A few minutes before serving pour the hot broth into the egg and cream mixture, return to fire and heat until boiling point is reached—do not allow to boil, as it may curdle. Salt to taste and serve at once. The fine point in making this sorrel soup is that it should be served very hot and yet cannot be made for long and kept hot as the egg-cream thickening will curdle. It should be stirred constantly after that is added, while heating to just short of boiling point.—(*Contributed by Elizabeth Remsen Van Brunt.*)

## APPETIZERS AND BEVERAGES

### *Grape Bud Appetizers*

Slit large white grapes just far enough to remove the seeds. Chill. Just before serving insert a toasted salted almond in the cavity of each grape. Spread salty cocktail crackers with cream cheese, sprinkled lightly with sage. Top with a Grape Bud.

### *Pineapple Mint Gems*

Drain chunks or wedges of canned pineapple. Roll in chopped mint. Insert a cocktail pick in each piece. Place on a glass plate and garnish with fresh sprigs of mint. Chill. Serve with a cool summer drink or hot chocolate.

### *Peanut Butter Canapés*

Mix equal parts of peanut butter and chili sauce. Spread on salted crackers and garnish with a wedge of radish and sprig of tarragon.

### *Shrimp Cocktail*

Prepare grapefruit in the shell. Leave a roomy center. Fill with shrimp previously marinated in herb French dressing. Garnish with fresh green cress.

### *Pigs in Clover*

Dip thin patties of sausage in beaten egg and then in crushed cornflakes. Pan fry slowly to a golden brown. Serve on a slice of fried apple sprinkled with chopped mint.

### *Curried Chicken Canapés*

1 cup finely chopped chicken and giblets
½ cup chopped, toasted almonds
1 teaspoon chives or grated onion
½ cup mayonnaise
½ to 1 tablespoon curry powder
Salt

Remove all bits of skin and gristle before chopping. Mix together. Season to taste with salt. Spread on crackers or toast cut in fancy shapes. The amount of curry used depends on individual taste. This spread is improved in flavor by several hours' chilling in the refrigerator or overnight. Makes 1½ cups spread.

### *Sugar Syrup for Fruit Punch*

2 cups water
1 cup honey
1 cup sugar
3 sprigs each of mint, lemon balm, burnet
1 sprig rue, hyssop

Boil all together for 10 minutes. Strain and pour into a sterilized jar. Chill and use for beverages.

### *Cranberry Cocktail*

1 qt. sweetened cranberry juice
2 tablespoons lemon juice
½ cup orange juice
Mint

Mix well and chill. Serve in cocktail glasses with a sprig of mint.

### *Mulled Cider*

2 qts. sweet cider
¾ cup brown sugar
1 teaspoon each of cinnamon, allspice, cloves
½ teaspoon nutmeg
¼ teaspoon salt
¼ cup lemon juice if desired

Mix well and simmer for 10 minutes. Strain and reheat. Pour into a raw pumpkin shell or earthenware punch bowl and garnish with small apples. Serve steaming hot. Serves 8.

### *Herb Butter Spreads*

For cañapés, small sandwiches, broiled meat or fish. To prepare any one of the following butters beat the ingredients into ¼ cup butter, creamed.

*Chives Butter*—Use 1 tablespoon minced chives and 1 teaspoon lemon juice.

*Parsley Butter*—Use 2 tablespoons minced parsley and 1 teaspoon lemon juice.

*Watercress Butter*—Use 2 tablespoons chopped watercress, 1 teaspoon lemon juice, and a few drops Worcestershire sauce.

*Tarragon Butter*—Use 2 tablespoons finely cut tarragon.

*Horse-radish Butter*—Use 2 tablespoons horse-radish.

## FISH AND MEAT

### *Lamb Fricassee with Dill*

2 tablespoons fat
½ cup sliced onion
2 pounds shoulder lamb cut in two inch cubes
1 teaspoon dill
Salt and pepper
2 cups water
6 new potatoes
2 pounds cabbage
6 small carrots

Fry onion to a light yellow color in fat in a deep saucepan. Add lamb, and brown on all sides. Season with salt and pepper to taste and add chopped dill with 2 cups boiling water. Simmer slowly for 1 hour. Add new potatoes and carrots. Cook 30 minutes, then lay cabbage cut in 1 inch wedges on top of meat, cover closely and steam 25 minutes longer or until cabbage is tender. If water evaporates add enough extra from time to time to keep about 2 cups in the pot. Serve on a large platter with lamb in the center and vegetables around it. Put a very small sprinkle of chopped dill on each potato. Thicken the sauce with 2 tablespoons flour and pour over fricassee. Serves 6.

### *Spareribs and Sauerkraut*

2 pounds spareribs
4 tablespoons fat
1 teaspoon sage
Salt and pepper
1 quart sauerkraut
½ teaspoon caraway seed

Rub sage, salt, and pepper generously into spareribs. Brown on all sides in a heavy kettle in fat. Remove from kettle and put sauerkraut and caraway seed in same kettle. Stir until thoroughly heated. Place spareribs on top of sauerkraut and cook slowly for 40 minutes. Serves 4 to 6.

### *Veal Patties with Fennel*

¼ cup chopped onion
¼ cup chopped celery
2 tablespoons butter
1½ pounds ground veal
Salt and pepper
¼ teaspoon dry mustard
½ teaspoon minced parsley
⅓ cup fennel root, chopped
2 tablespoons cracker crumbs
¼ cup milk
2 tablespoons cooking fat

Sauté onion and celery in butter but do not brown. Combine veal with seasonings, cracker crumbs, and milk. Shape into patties and brown on both sides in hot fat in heavy frying pan. Reduce heat and cook 10 to 12 minutes longer. Serves 6.

### *Chicken Gumbo*

3 to 4 pound fowl
1 pound veal neck
¼ cup cooking oil
1 small onion, sliced
1½ quarts boiling water
2 dozen oysters (optional)
Pepper
1 teaspoon filé or
1½ teaspoons chopped fresh sassafras leaves

Filé powder is made from dried sassafras leaves. When okra is available it is used instead of filé to give the same consistency Never use the two together and never *boil* the filé. Substitute about 1½ cup sliced okra for the above filé.

Clean chicken and cut in pieces. Cut veal in 2 inch cubes. Sauté in fat in a large heavy kettle until browned, adding the onion the last 10 minutes of cooking. Add water, salt, and pepper, and simmer 2 to 3 hours or until chicken is tender. Cut chicken from bones and return it to soup stock. Add oysters and cook until edges curl. Season well with additional salt and pepper; stir in filé and serve in hot dishes. Serves 6 to 8.

### *Baked Stuffed Fish*

4 pound fish, boned
¼ cup butter
1 cup hot water
Salt and pepper
1 tablespoon chopped fennel

Wipe fish with a damp cloth. Sprinkle inside and out with salt and pepper. Fill with Fish Stuffing and tie securely. Bake in a shallow pan at 375° about 50 minutes. Baste frequently with butter, fennel, and hot water. When done remove to hot plank or platter and garnish with:

1. Buttered new potatoes rolled in chopped chives or watercress.
2. Tiny whole carrots.
3. New green peas.
4. Lemon relish cups.
5. Parsley.

### *Fish Stuffing*

3 cups soft bread crumbs
1 medium onion, chopped
½ cup butter
Salt and pepper
1 egg, beaten

Sauté onion in butter. Add crumbs and seasoning. Mix well but do not brown. Remove from heat and stir in beaten egg.

### *Stuffed Cabbage Leaves*

1½ pounds veal, lamb or beef
3 sprigs fresh dill
¾ cup rice (raw)
3 tablespoons minced onion
12 large cabbage leaves
5 tablespoons butter
½ cup sour cream
½ cup milk
Salt and pepper
1 tablespoon ketchup
1 teaspoon chopped dill

Stew meat until tender in 1 quart of water to which the sprigs of dill have been added; reserve broth and grind meat; add rice and onion to meat and season with salt and pepper. Wilt cabbage leaves by submerging in boiling water for one minute; fill each with meat-rice mixture, roll and tie securely. Brown cabbage rolls in butter, place in casserole, pour reserved broth over them, about 2 cups, cover and bake in a slow oven (325° F.) for 1½ hours. Combine cream, milk, seasonings, dill, ketchup. Heat and serve as sauce. Serves 6.

### *Roast Duck with Herb-Buttered Rice and Orange Sauce*

3 lbs. roasting duck
Salt and pepper
1 sliced onion and carrot
Bunch of celery leaves and parsley
1 cup orange juice mixed with 1 teaspoon each of savory, marjoram
2 tablespoon cooked slivered orange rind
¼ cup chopped onion
¼ cup butter
4 cups hot, cooked rice—wild, brown or white (salted)
½ teaspoon each of sage, thyme
1 tablespoon parsley
Garnish with watercress and glazed fruit

Clean and quarter duck. Rub with salt and pepper. Put onion, carrot, celery, parsley in bottom of shallow roasting pan. Place duck, skin side up, on top of vegetables. Bake in a moderate oven (350° F.) for 1½ hrs. Baste frequently with orange juice and herbs. Remove duck.

*Sauce.* Strain the vegetables from the roasting pan. Skim off most of the fat. Add enough water to make 1½ cups. Thicken with 2 tablespoons flour mixed to a paste with ⅓ cup water. Bring to a boil and add orange slivers, and salt if necessary.

*Rice.* Brown onion in fat. Stir in the rice and herbs. Arrange on hot platter with duck and garnish with watercress and glazed fruit.

### *Shrimp and Rock Lobster Creole*

1 cup sliced onions
1 cup sliced celery
4 tb. flour
1 tsp. salt
2 tb. chili powder
1 cup water
3 cups tomatoes
3 large sprigs tarragon
1 tb. tarragon vinegar
2 tsp. sugar
1 cup cooked shrimp
2 cups rock lobster cooked and cut in small pieces
3 cups hot boiled rice
4 tb. chopped pimento

Boil the rock lobster and shrimp in their shells in salted water and tarragon for twenty minutes. Then remove the meat from the shell. Cook the onion and celery in the fat until brown, stir in flour, salt, and chili powder and slowly add the water. Stir until smooth and cook over heat for 15 minutes. Add tomatoes, vinegar, and sugar and cook until thickened; add shrimp and lobster and cook until thoroughly heated. Mold rice in cones or in a ring and surround with shrimp and lobster creole. Garnish with asparagus tips and deviled eggs and pimento. Serves 6 to 8.

N.B. Rock lobster, also known as "poor man's lobster," is actually meat from the tail of a sea crawfish. It is a crustacean and comes to New York from Florida, Cuba, and South Africa. Rock lobster is inferior to real Maine lobster, but with clever cooking may be very delicious.

## SAUCES AND EGGS

### *Potato Omelet with Watercress*

¼ cup milk
1 cup mashed potatoes
2 tablespoons butter
4 eggs
½ teaspoon salt
2 tablespoons chopped watercress

Mix potato with 1 tablespoon butter, milk seasoning and watercress. Separate the eggs and add beaten yolks to potato mixture. Fold in the stiffly beaten egg whites. Heat remaining tablespoon butter in a skillet, add egg mixture and cook slowly. As omelet becomes firm on the bottom lift edges with a spatula to let raw mixture run underneath. Place under the broiler to brown top. Crease omelet with a knife, fold over and serve. Serves 6.

### *Brown Sauce*

2 tablespoons each of carrot, onion, celery
1 shallot
½ bay leaf
Sprig of thyme and parsley
6 pepper corns
2 cloves
4 tablespoons butter
4 tablespoons flour
2 cups brown stock
Salt and pepper

Cook vegetables and spices in butter until well browned but not burned; add flour and brown slightly. Add stock gradually and stir until well blended and thick. Season with salt and pepper. Boil 1 or 2 minutes, strain and serve with beef, or bottle for future use. Keep cool.

### Bordelaise Sauce

½ cup tomato puree
1 tablespoon sherry wine
4 slices of meat marrow
1 cup Brown Sauce

Heat together thoroughly and serve with steak.

### Béchamel Sauce

1 slice onion
1 slice carrot
½ bay leaf
Sprig parsley
6 pepper corns
1 cup chicken stock
2 tablespoons flour
2 tablespoons butter
½ cup light cream
½ teaspoon salt
½ teaspoon pepper

Simmer first 6 ingredients 20 minutes. Strain and add hot water to make ½ cup. Blend flour and melted butter, add hot stock and cream and cook 5 minutes, stirring constantly. Season. Serve on chicken timbals, croquettes, mousse, or fried chicken.

### Ravigotte Sauce

Add 1 teaspoon each chopped chives, parsley, tarragon, shallots and 1 tablespoon tarragon vinegar to 1 cup Béchamel Sauce.

### Normandy Sauce

Substitute fish stock for chicken stock in Béchamel Sauce, add 1 beaten egg yolk, 1 tablespoon lemon juice and a dash of cayenne. Serve with fish mousse, timbals, or soufflé.

### Mustard Sauce

2 teaspoons chives, minced
2 teaspoons chervil, minced
1 teaspoon tarragon, thyme, basil
¼ cup prepared mustard
½ cup mayonnaise
Cayenne

Mix thoroughly. Good either hot or cold on meat or fish.

## Sweets, Cookies and Buns

### *Apricot Sweets*

1 cup raw dried apricots
1 cup dried coconut
1 teaspoon orange rind
1 teaspoon lemon rind
1 tablespoon lemon juice
4 tablespoons confectioner's sugar
1 teaspoon anise seeds

Grind apricots and coconut through the food chopper. Add fruit juice, rind, and sugar. Mix well and form into small balls. Roll in granulated sugar.

### *Coconut Kisses*

1 can condensed milk
12 oz. shredded coconut
1 teaspoon vanilla
1 teaspoon crushed caraway seeds

Into the condensed milk stir coconut; add flavoring and seeds. Drop by teaspoonfuls two inches apart on a baking sheet, and bake in a slow oven (325° F.) for 12 to 15 minutes or until brown.

### *Candied Mint Leaves*

Wash any kind of mint leaves very thoroughly. Dip in egg white, which has been broken slightly, but not foamy, with a fork. Strip off any excess egg with the thumb and forefinger. Dredge each leaf through a bowl of granulated sugar. Shake off all excess sugar and place on a wire rack to dry in the sun. When sufficiently dry store in boxes.

### *Cardamom Cookies*

½ cup shortening
½ cup sugar
1 egg yolk
1½ cups sifted flour
½ teaspoon baking powder
¼ teaspoon salt
3 tablespoons milk
½ teaspoon crushed cardamom seeds

Cream the shortening. Add sugar slowly and cream well. Add egg yolks and again beat well. Sift dry ingredients and mix with cardamom seeds. Add alternately with milk to first mixture.

Chill thoroughly. Roll very thin and cut with a wreath or tree cutter. Place on a greased cookie pan and bake 10 minutes at 375° F. (moderate oven).

### *Cumin Cup Cakes*

4 tablespoons butter
½ cup sugar
1 egg, unbeaten
1 cup sifted flour
2 teaspoons baking powder
⅛ teaspoon salt
⅓ cup milk
½ teaspoon vanilla
1 teaspoon cumin seed, cooked in 1 tablespoon water 5 minutes

Cream the butter, add sugar gradually and cream thoroughly. Add egg and cumin seed and heat well. Sift flour, baking powder, and salt, and add alternately with milk and vanilla to the first mixture. Bake in oiled muffin tins or paper cup-cake forms in a hot oven (400° F.) for 20 minutes. Makes about 12 medium cakes. Sprinkle tops lightly with confectioner's sugar.

### *Rum Cakes*

Angel cake
Hard sauce
Hot water
Rum flavoring
Chopped black or English, walnuts
Crushed coriander seeds

Break angel cake in irregular pieces the size of an English walnut. Dip in hard sauce which has been thinned with hot water and flavored with rum and coriander seeds. Roll in coarsely chopped walnuts and place on wax paper to dry.

N.B. To conserve home supply of sugar use bakers' cake and make hard sauce by combining 1 part margarine or butter and 2 parts condensed milk. Use ¼ to ½ teaspoon crushed coriander seed to 1 cup hard sauce.

### *Spritzbakkeiser*

2 cups butter or margarine
1 cup sugar
4 cups flour
2 eggs
1 teaspoon almond extract
Candied cherries
Candied angelica

Cream butter and add sugar gradually. Add eggs well beaten, flavoring, and flour. Force through cookie press onto baking sheet. Decorate with candied cherries and angelica. Bake 12 minutes in a moderate oven (375° F.).

### *Swedish Coffee Buns*

1 cup milk
¼ cup shortening
¼ cup sugar
½ teaspoon salt
1 egg, well-beaten
½ teaspoon nutmeg
½ teaspoon ground cardamom seeds
1 yeast cake
½ cup seedless raisins
3½–4 cups sifted flour
Confectioner's sugar

Scald milk, add fat, sugar, and salt. Cool to lukewarm. Add crumbled yeast cake, egg, raisins, nutmeg, cardamon, and as much flour as can be stirred into dough. Knead well. Place in greased bowl, cover, and let rise in a warm place until double in bulk; toss on floured board and shape into 2-inch balls; cover and let rise, as above. Bake in a hot oven (400° F.) 15 to 20 minutes. Cool and brush tops with icing, made with confectioner's sugar moistened with water. Yield: 2 dozen buns.

### *Nut Wafers*

¼ cup shortening (margarine)
¾ cup sugar
1 egg, beaten
1⅓ cup flour
2 tablespoons milk
½ teaspoon salt
1 teaspoon baking powder
1 teaspoon anise seed
⅓ cup chopped nut meats

Cream shortening and add sugar gradually. Cream very well. Add egg, milk and flour sifted with salt and baking powder, and anise seed. Spread evenly and very thinly on greased bottom of baking tin using a case knife. Sprinkle with nut meats and press gently into batter. Mark in strips ¾ inch wide and 3 inches long. Bake about 12 minutes at 325° F. or until delicately brown. Cut in strips and lay at once over rolling pin to shape in a semi-circle. Press gently with hand. Remove to cake rack to harden. If strips become too stiff to shape return to oven to soften. Store in single layer in a shallow box to prevent breaking. Makes about 40 strips.

### *Tansy Pudding*

2 tablespoons butter
3 tablespoons flour
1¼ cup scalded milk
4 eggs, yolk and whites separated
⅓ cup sugar
Green coloring
1 teaspoon chopped tansy leaves

Melt butter in saucepan and add flour and a pinch of salt, then with a wooden spoon blend together with milk. Beat yolks of eggs in bowl until light, add sugar and pour in the flour and milk mixture, stir well and return to saucepan on fire. Cook until thick, stirring constantly to keep smooth. Add a very little green coloring to tint pale green and the minced tansy leaves. When cool fold in the stiffly beaten whites of eggs and pile lightly into buttered glass baking dish.

Bake for 30 minutes in moderate oven. Serve with slightly whipped cream and bowl of powdered maple sugar.—(*Contributed by Elizabeth Remsen Van Brunt.*)

## Salads

### *Potato Salad*

2 cups diced, hot potatoes
1 hard cooked egg, diced
½ teaspoon salt, or more
½ cup celery, diced
2 tablespoons minced onion or chives
1 tablespoon minced pimento
2 teaspoons capers
1 tablespoon tarragon vinegar
1 tablespoon salad oil
Mayonnaise
2 teaspoons fresh dill

Mix lightly and chill. Mold in fancy shapes with aspic jelly or serve plain. *Note:* Use prepared aspic or make it from a reliable recipe.

#### *Variations*

1. Decorate the bottom of a well oiled ring. Mold with slices of hard cooked egg, olives, or pimento. Fill with Potato Salad which has been lightly mixed with aspic jelly. Chill several hours. Turn out on a bed of lettuce and fill the hole in the center of the mold with mayonnaise in a lettuce cup.

2. Mix Potato Salad with tomato aspic. Place a row of sliced stuffed olives down the center of an oiled loaf mold. Fill with salad and chill. Turn out on curly endive. Garnish with stuffed eggs and radish roses alternating.

3. Garnish with thin slices of tomato topped with a slice of cucumber and a bit of horse-radish.

4. Slices of ham or tongue spread with mustard and rolled loosely.

5. Garnish with sweet gherkins, onion rings, and radishes.

6. Mold in a melon mold; serve with a garnish of small peeled tomatoes stuffed with cole slaw and 1 teaspoon dill.

7. Served plain on lettuce and garnish with stuffed eggs molded individually in tomato aspic.

## *Fruit Salad*

1 package lemon jello
1 cup seedless white grapes
½ cup celery, diced
1 small red apple, diced, unpeeled
1 grapefruit, divided in segments
1 orange, divided in segments
1 cup Queen Anne cherries

Other fruit combinations may be substituted.

Prepare jello by directions on the package. Mix with fruit. The mixture should be practically all fruit and very little excess liquid jello. Chill and serve very cold with any fruit salad dressing desired.

## *Variations*

1. Pour into a ring mold. When set turn on a bed of lettuce and fill center with cantaloupe balls and sprigs of mint.

2. Mold in star shape and garnish with cream cheese balls rolled in nuts.

3. Decorate bottom of loaf mold with sections of tangerines. Mold salad very firmly.

4. Decorate sides of mold with half slices of pineapple and red maraschino cherries.

5. Mold in a mixing bowl. Turn out on salad greens and garnish with semi-circles of cantaloupe, red sweet cherries filled with

cream cheese, and finger length pieces of fresh pineapple rolled in mint.

6. Omit jello. Mix fruit with equal parts of mayonnaise and whipped cream. Sprinkle with nuts.

### *Mixed Green Salad*

Break, do not cut, a variety of salad greens such as romaine, escarole, chicory, lettuce, and watercress into a salad bowl. Add sliced cucumber, onion rings, green peppers, radishes, quartered tomatoes, etc. Season with salt and dress with Herb French Dressing.

### *Herb French Dressing*

1 cup salad oil
⅓ cup tarragon vinegar
1 clove garlic, bruised
1 teaspoon chives or grated onion
1 teaspoon sugar
Paprika
Salt and pepper
1 teaspoon dried mixed herbs, or
1 teaspoon each of fresh basil, tarragon, chervil, and parsley

Shake thoroughly in a jar. Let stand several hours or overnight, then strain and store.

*Note.*—For Horehound candy see pp. 12–13. (*Ed.*)

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3. Periodical distribution of surplus ornamental plant material and seeds.
4. Invitations for self and friends to the Annual Spring Inspection, and to spring and fall "Flower Days"; cards of admission to all exhibitions and openings preceding the admission of the general public, and to receptions; admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Services of a guide (by appointment) for self and party, when visiting the Garden.
6. Free tuition in all courses of instruction, except that in laboratory courses a small fee is charged to cover cost of materials, etc.
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## CLASSES OF MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following eight classes of membership may be taken out through the Botanic Garden:

| | | |
|---|---|---|
| 1. | Annual, by annual payment of ....... | $ 10 |
| 2. | Sustaining, by annual payment of .... | 25 |
| 3. | Contributing, by annual payment of .. | 100 |
| 4. | Life, by one payment of ............. | 500 |
| 5. | Permanent, by one payment of ....... | 2,500 |
| 6. | Donor, by one payment of ........... | 10,000 |
| 7. | Patron, by one payment of .......... | 25,000 |
| 8. | Benefactor, by one payment of ....... | 100,000 |

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to eight carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members also enjoy the special privileges indicated on a preceding page.

Further information concerning membership may be had by addressing The Director, Brooklyn Botanic Garden, Brooklyn, N. Y., or by personal conference by appointment. Telephone, Main 2-4433.

NOTE: *Contributions to the Brooklyn Botanic Garden, through membership dues or otherwise, constitute proper deductions under the Federal and New York State Income Tax Laws.*

# CLUB MEMBERSHIPS

For many years the Botanic Garden has had the pleasure of cooperating in numerous ways with Garden Clubs, Women's Clubs, and other organizations of the Metropolitan area, and a plan has been adopted whereby such organizations may become definitely identified with the work of the Garden in promoting an interest in plant life and horticulture, as follows:

*Annual Memberships.*—Garden Clubs or other organizations may qualify as Annual Members of the Garden on election by the Board of Trustees and payment of the annual membership fee of Ten Dollars. Each annual member club may designate one of its officers or other member to receive such invitations, notices, and publications as go to individual annual members and to represent the club at all Botanic Garden functions, including "Flower Days" and the annual Spring Inspection in May.

The Club may also have the following privileges:

*a.* *The services of a Botanic Garden docent or guide* for a tour of the plantations or conservatories, followed by tea. No parties of less than six adults will be conducted. Schedule for such events must be arranged for in advance, at dates mutually convenient to the Botanic Garden and the Club.

*b.* *One extra-mural lecture a year* by a member of the Garden staff. The Garden supplies, on request, a list of staff members available for outside lectures.

Arrangements will be facilitated if the Club will, with each request, designate at least two names.

*c.* One member of the club is entitled annually to free tuition in courses of instruction for which tuition is charged to non-members. In Laboratory Courses a nominal fee is charged to cover cost of material.

*Sustaining Memberships.*—Any club or other organization may become a Sustaining Member of the Garden on election by the Board of Trustees and annual payment to the Garden of the sustaining membership fee of Twenty-five Dollars.

Sustaining membership clubs enjoy the full privileges of annual membership, not only in the Botanic Garden but also in the Brooklyn Museum and The Institute at the Academy of Music. They may designate three members who may receive free tuition in Botanic Garden courses of instruction for which tuition is charged to non-members. They are entitled each year to two extra-mural lectures free, by a lecturer chosen from the Garden's list of lecturers.

## OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
Berkshire Museum, Springfield, Mass.
Boston Society of Natural History, Boston, Mass.
Buffalo Museum of Science, Buffalo, N. Y.
California Academy of Sciences, San Francisco, Calif.
Carnegie Museum, Pittsburgh, Pa.
Charleston Museum, Charleston, S. C.
Cranbrook Institute of Science, Bloomfield Hills, Mich.
Everhart Museum of Natural History, Science and Art, Scranton, Pa.
Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
Field Museum of Natural History, Chicago, Ill.
Los Angeles Museum, Los Angeles, Calif.
Massachusetts Horticultural Society, Boston, Mass.
Missouri Botanical Garden, St. Louis, Mo.
Newark Museum, Newark, N. J.
New York State Museum, Albany, N. Y.
Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
Pennsylvania Horticultural Society, Philadelphia, Pa.
Philadelphia Commercial Museum, Philadelphia, Pa.
Southwest Museum, Los Angeles, Calif.

V

# FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

### Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which said sum to be used for the educational and scientific work of the Brooklyn Botanic Garden.

### Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of................Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

### Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which sum to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as the ..............................................fellowship.

### Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *

..............................................................................

..............................................................................

* The following additional purposes are suggested for which endowment is needed:

1. Botanical research.
2. Publishing the results of botanical investigations.
3. Popular botanical publication.
4. The endowment of a lectureship, or a lecture course.
5. Botanical illustrations for publications and lectures.
6. The purchase and collecting of plants.
7. The beautifying of the grounds.
8. The purchase of publications for the library.
9. Extending and enriching our work of public education.
10. The establishing of prizes to be awarded by the Brooklyn Botanic Garden for botanical research, or for superior excellence of botanical work in the High Schools of the City of New York.

## REGULATIONS CONCERNING PHOTOGRAPHING, PAINTING, AND SKETCHING

1. No permit is required for photographing with a hand camera, or for sketching or painting without an easel on the Grounds or in the Conservatories.

2. Sketching and painting with an easel and the use of a camera with tripod are not allowed in the Oriental Garden, the Rose Garden, the Local Flora Section (Native Wild Flower Garden), nor the Conservatories at any time without a permit. No permits are given for use after 12 o'clock noon on Sundays and holidays.

3. Artists, and the public in general, may not bring into the Botanic Garden chairs, stools, or anything to sit in or on.

4. Holders of permits must not set up tripod cameras nor easels in such a way as to involve injury to living plants or lawns, nor to cause an obstruction to traffic on congested paths or walks.

5. Application for permits should be made at the office of the Director, Laboratory Building, Room 301, or by mail (1000 Washington Avenue), or by telephone (MAin 2–4433).

# THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

**FOUNDED, 1824. REINCORPORATED, 1890**

ADRIAN VAN SINDEREN, *President.* EDWARD C. BLUM, *Chairman of the Board.*

## THE DEPARTMENT OF EDUCATION

**BROOKLYN ACADEMY OF MUSIC—30 LAFAYETTE AVENUE—STerling 3–6700**

## BROOKLYN BOTANIC GARDEN

**1000 WASHINGTON AVENUE—MAin 2–4433**

## THE BROOKLYN MUSEUM

**CENTRAL MUSEUM—EASTERN PARKWAY—NEvins 8–5000**
**CHILDREN'S MUSEUM—BROOKLYN AVENUE AND PARK PLACE**
**—PRospect 3–7117**

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10. Membership privileges in other botanic gardens and museums outside of Greater New York are offered to our members when they are visiting other cities and on presentation of Brooklyn Botanic Garden membership card.

# CLUB MEMBERSHIPS

For many years the Botanic Garden has had the pleasure of cooperating in numerous ways with Garden Clubs, Women's Clubs, and other organizations of the Metropolitan area, and a plan has been adopted whereby such organizations may become definitely identified with the work of the Garden in promoting an interest in plant life and horticulture, as follows:

*Annual Memberships.*—Garden Clubs or other organizations may qualify as Annual Members of the Garden on election by the Board of Trustees and payment of the annual membership fee of Ten Dollars. Each annual member club may designate one of its officers or other member to receive such invitations, notices, and publications as go to individual annual members and to represent the club at all Botanic Garden functions, including "Flower Days" and the annual Spring Inspection in May.

The Club may also have the following privileges:

a. *The services of a Botanic Garden docent or guide* for a tour of the plantations or conservatories, followed by tea. No parties of less than six adults will be conducted. Schedule for such events must be arranged for in advance, at dates mutually convenient to the Botanic Garden and the Club.

b. *One extra-mural lecture a year* by a member of the Garden staff. The Garden supplies, on request, a list of staff members available for outside lectures.

Arrangements will be facilitated if the Club will, with each request, designate at least two names.

c. One member of the club is entitled annually to free tuition in courses of instruction for which tuition is charged to non-members. In Laboratory Courses a nominal fee is charged to cover cost of material.

*Sustaining Memberships.*—Any club or other organization may become a Sustaining Member of the Garden on election by the Board of Trustees and annual payment to the Garden of the sustaining membership fee of Twenty-five Dollars.

Sustaining membership clubs enjoy the full privileges of annual membership, not only in the Botanic Garden but also in the Brooklyn Museum and The Institute at the Academy of Music. They may designate three members who may receive free tuition in Botanic Garden courses of instruction for which tuition is charged to non-members. They are entitled each year to two extra-mural lectures free, by a lecturer chosen from the Garden's list of lecturers.

# OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
Berkshire Museum, Springfield, Mass.
Boston Society of Natural History, Boston, Mass.
Buffalo Museum of Science, Buffalo, N. Y.
California Academy of Sciences, San Francisco, Calif.
Carnegie Museum, Pittsburgh, Pa.
Charleston Museum, Charleston, S. C.
Cranbrook Institute of Science, Bloomfield Hills, Mich.
Everhart Museum of Natural History, Science and Art, Scranton, Pa.
Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
Field Museum of Natural History, Chicago, Ill.
Los Angeles Museum, Los Angeles, Calif.
Massachusetts Horticultural Society, Boston, Mass.
Missouri Botanical Garden, St. Louis, Mo.
Newark Museum, Newark, N. J.
New York State Museum, Albany, N. Y.
Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
Pennsylvania Horticultural Society, Philadelphia, Pa.
Philadelphia Commercial Museum, Philadelphia, Pa.
Southwest Museum, Los Angeles, Calif.

## CLASSES OF MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following eight classes of membership may be taken out through the Botanic Garden:

| | |
|---|---|
| 1. Annual, by annual payment of ....... | $ 10 |
| 2. Sustaining, by annual payment of .... | 25 |
| 3. Contributing, by annual payment of .. | 100 |
| 4. Life, by one payment of ............. | 500 |
| 5. Permanent, by one payment of ....... | 2,500 |
| 6. Donor, by one payment of ........... | 10,000 |
| 7. Patron, by one payment of .......... | 25,000 |
| 8. Benefactor, by one payment of ....... | 100,000 |

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to eight carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members also enjoy the special privileges indicated on a preceding page.

Further information concerning membership may be had by addressing The Director, Brooklyn Botanic Garden, Brooklyn, N. Y., or by personal conference by appointment. Telephone, Main 2-4433.

NOTE: *Contributions to the Brooklyn Botanic Garden, through membership dues or otherwise, constitute proper deductions under the Federal and New York State Income Tax Laws.*

# FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

### Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which said sum to be used exclusively for the educational and scientific work of the Brooklyn Botanic Garden.

### Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

### Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which sum to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as the ...............................................fellowship.

### Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *

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* The following additional purposes are suggested for which endowment is needed:

1. Botanical research.
2. Publishing the results of botanical research.
3. The endowment of curatorships.
4. The Library.
5. The Herbarium.
6. Extending and enriching our work of public education.
7. The purchase and collecting of plants.
8. Popular botanical publication.
9. Illustrations for publications and lectures.
10. The beautifying of the grounds.

## VII

## THE BOTANIC GARDEN AND THE CITY

THE BROOKLYN BOTANIC GARDEN, established in 1910, is a Department of the Brooklyn Institute of Arts and Sciences. It is supported in part by municipal appropriations, and in part by private funds, including income from endowment, membership dues, and special contributions. Its articulation with the City is through the Department of Parks.

The City owns the land devoted to Garden purposes, builds, lights, and heats the buildings, and keeps them in repair, and includes in its annual tax budget an appropriation for other items of maintenance. One third of the cost of the present buildings (total cost, about $300,000), and other permanent improvements to a total of more than $281,000, has been met from private funds.

Appointments to all positions are made by the director of the Garden, with the approval of the Botanic Garden Governing Committee, and all authorized expenditures for maintenance are made in the name of the private organization, from funds advanced by the Institute, which, in turn, is reimbursed from time to time by the City, within the limits, and according to the terms of the annual Tax Budget appropriation. Certain salaries are paid, in whole or in part, from private funds.

All plants have been purchased with private funds since the Garden was established. In addition to this, it has been the practice of the Garden, from its beginning, to purchase with private funds all publications for the library, all specimens for the herbarium, all lantern slides and photographic material, and numerous other items. These collections, available without charge for public use, are the property of the Trustees.

The interest on One Million Dollars at the rate of 3.5 per cent, added to the present private funds income, would restore that income to the 1930 figure. The director will be glad to give full information as to the uses for which such additional income is needed.

# REGULATIONS CONCERNING PHOTOGRAPHING, PAINTING, AND SKETCHING

1. No permit is required for photographing with a hand camera, or for sketching or painting without an easel on the Grounds or in the Conservatories.

2. Sketching and painting with an easel and the use of a camera with tripod are not allowed in the Oriental Garden, the Rose Garden, the Local Flora Section (Native Wild Flower Garden), nor the Conservatories at any time without a permit. No permits are given for use after 12 o'clock noon on Sundays and holidays.

3. Artists, and the public in general, may not bring into the Botanic Garden chairs, stools, or anything to sit in or on.

4. Holders of permits must not set up tripod cameras nor easels in such a way as to involve injury to living plants or lawns, nor to cause an obstruction to traffic on congested paths or walks.

5. Application for permits should be made at the office of the Director, Laboratory Building, Room 301, or by mail (1000 Washington Avenue), or by telephone (MAin 2-4433).

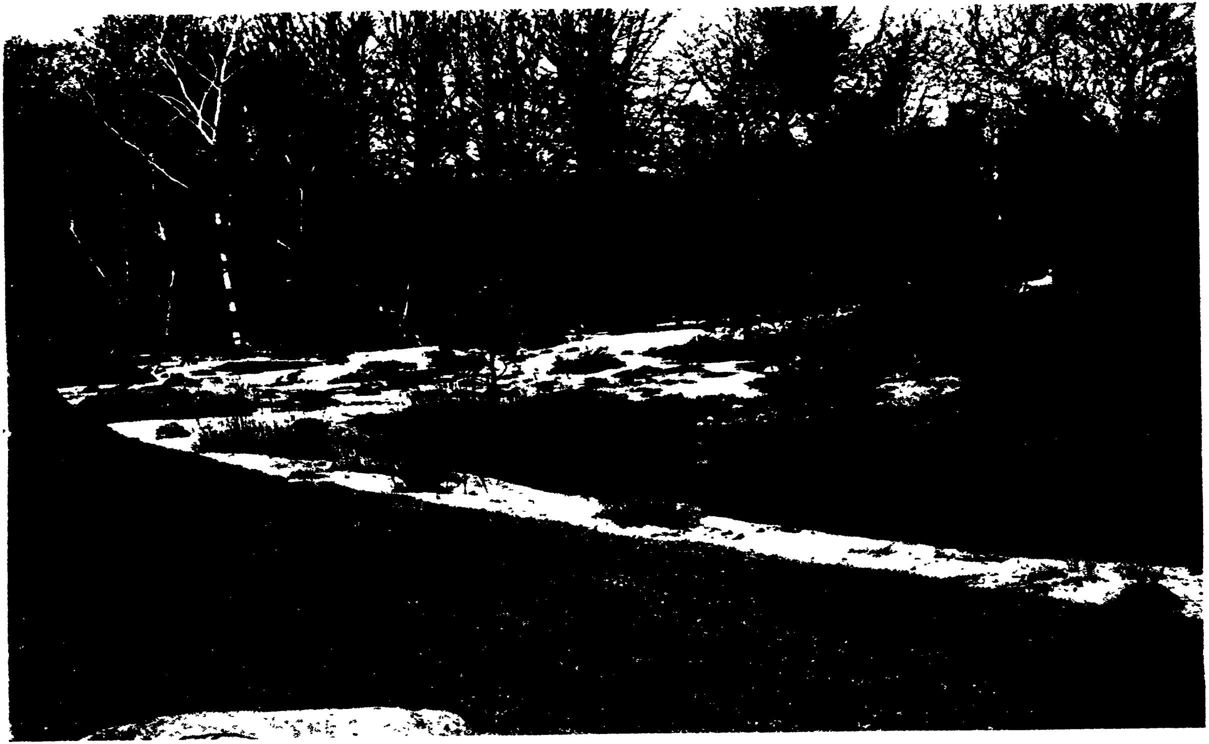

FIG. 1. Native Wild Flower Garden (Local Flora). View in early spring, 1942, looking north across pond and sand barren. (10,409)

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXXII APRIL, 1943 NO. 2

# THIRTY-SECOND ANNUAL REPORT
# OF THE
# BROOKLYN BOTANIC GARDEN
# 1942

## REPORT OF THE DIRECTOR[1]

To the Botanic Garden Governing Committee:

I have the honor to present herewith my Thirty-second Annual Report.

### The Impact of War

Almost every activity of the Botanic Garden in the year 1942 has been determined or modified by an event which took place nearly 5000 miles from Brooklyn, about four weeks before the close of 1941. The attack of December 7, on Pearl Harbor, as everyone knows, brought the United States into the universal war as a formal and active co-belligerent of Great Britain and her allies.

No aspect of the war is more thoroughly organized nor more fanatically fought by the enemy than that against religion, morals, and education. Every day, throughout a nation of eighty million people in Europe, children, adolescents, and adults, for ten years or more, have been and are now being, not educated, but indoctrinated with a way of life which goes back to the cave and the jungle. Thus is being created the most serious aspect of the struggle, which will have to be fought out for many years after the shooting is over.

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[1] The illustration on the front cover page shows the "V," for victory, and the Morse Code sign for "V" (. . . —) done in red, white, and blue petunias. These designs were on the south end of the Esplanade throughout the 1942 season. The small trees are flowering cherries—part of the two double rows (76 trees in all) planted on each side of the Esplanade in the fall of 1941. A portion of the pool in the Rose Arc is in the foreground.

The chief way in which this battle of ideas and ideals can be won is by the method of St. Paul, of overcoming evil with good. When the battle of tanks and planes has been won then, writes Gregor Ziemer,[1] "behind the military array we will perceive a younger army, even more fanatic than the soldiery of now; and this army too must be vanquished. . . ." Never did a part of the human race face so formidable and so serious an educational challenge as is here presented. Our first obligation is to preserve and perfect in our own land the educational aims, methods, and ideals which characterize our civilization and our way of life. They constitute the most precious inheritance of the human race. The challenge is to every educational agency—our elementary and high schools, of course, our colleges, universities, and technical schools, our museums and botanic gardens.

Our second obligation is to continue the educational responsibility to improve, to augment, and to disseminate this heritage among men; if it is allowed to languish or die out, any victory of ours of tanks and bombs is futile. The Botanic Garden has a part, however modest, in this opportunity and responsibility, and feels fully justified in asking the continuing and generous support that is necessary to enable it to carry on its program as an essential and integral part of the world conflict that now rages.

## General Attendance

The turnstiles at the entrance gates registered a total attendance for the year of 1,660,046. For 1941 the figures were 1,753,381—a decrease of 93,335. This figure is rather encouraging when compared with the figures of other semi-public institutions of greater New York. A "Recapitulation" of comparative attendance, compiled by the Museums Council of New York City, shows an increased attendance for 1942 over 1941 only for two privately supported institutions—the Museum of Modern Art, 5,347, or 2% (25 cents admission); the New York Museum of Science and Industry, 53,639, or 15% (25 cents admission). For the semi-public institutions (supported in part by Tax Budget appropriations) the decreases in attendance were as follows: Brooklyn Botanic Garden; 5%; Metropolitan Museum of Art, 13%; American Museum of Natural History, 14%; New York Public Library, 17%; Brooklyn Museum, 27%; New York Zoological Park, 32%

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[1] *Ziemer, Gregor.* Education for death. Oxford University Press. 1941. P. 194.

## COOPERATION IN THE WAR EFFORT

How can botanical science contribute to the war effort? In many ways of vital importance. Food, for example, as the Secretary of Agriculture, Mr. Wickard, has said, is "a most powerful weapon" of war. It is needed now in greater amount than ever before—for the armed forces and the civilian needs of our own country and our allies. Knowledge arrived at by botanical studies underlies all attempts to increase the yield of food plants.

For example, some years ago, Dr. George H. Shull undertook a study of the breeding of Indian corn with a purely scientific aim in view. His results, published in 1908 and 1909, marked the beginning of a new era in corn breeding. "Hybrid corn is the most spectacular and far-reaching agricultural development of this generation. It ranks in importance with the invention of the telephone and the internal combustion engine." By 1937 80% of the yellow sweet corn for canning was grown from "Hybrid seed," produced by following a method based on the principles worked out by Dr. Shull. This year more than 25 million acres—slightly more than one half the acreage of the corn belt—is grown from hybrid corn. There is not a soldier in our army, not a citizen of the United States, that does not benefit from this piece of research in "pure" botany. It has been estimated that the value of the corn crop of this country has been increased by several million dollars a year by this practical application of Dr. Shull's results. Instances could be multiplied, not only in the realm of food production, but also in the use of plants and plant products for drugs, fibres, paper, lumber, and otherwise, and in plant diseases—all of the highest importance for war needs.

There is much that a botanic garden might be doing now in botanical exploration to discover new plants or new locations of plants important to meet pressing needs, but this requires funds quite beyond the present resources of our own Garden. There are, however, many other ways in which a botanic garden may render war service, especially in aiding civilian activities necessitated by the war.

The first thought, of course, is, through gardening and, quite naturally through vegetable gardening—doing everything possible to promote the raising of food plants. In 1917 and 1918, during the World War, the lawns of the Botanic Garden (as elsewhere) were plowed up. The laboratory plaza was given over to garden vegetables; a field of potatoes occupied part of the Systematic Section.

On December 19 and 20, 1941, a National Defense Gardening Conference in Washington, D. C., was called jointly by the U. S. Department of Agriculture and the Office of Defense, Health, and Welfare. Delegates representing garden interests were present from all sections of the country. The main object was to formulate the horticultural needs of the hour, and outline a long-term plan of action by Federal, state, municipal, and private agencies. Six committees were established, as follows: 1. Farm vegetable gardens; 2. Farm fruit gardens; 3. Conservation and preservation of fruits and vegetables; 4. Community and school gardens; 5. Conservation of lawns, flowers, and shrubs; 6. Educational materials and techniques.

These committees, jointly and severally, recommended:

1. That gardening be recognized as an active part of the war effort;

2. That opportunity be given to boys and girls, under qualified leadership, to participate in a "Victory Garden Program" as an integral part of their education;

3. That, in the Victory Garden Program, gardening be emphasized not only as a means of raising of plants, but as an essential part of a productive and useful life;

4. That popular information concerning gardening be made available through every qualified agency. .

5. That the importance of ornamental gardening should not be lost sight of as a help in maintaining individual and community morale.

The Botanic Garden has endeavored to cooperate in all the aspects of this intelligent and broad program, which embodies, with minor shifting of emphasis, the main points of our regular program of education and public service.

### *Victory Garden Public Meeting*

Botanic Garden members and the general public were invited to a public Victory Garden meeting in our auditorium on February 19. Dr. Gager stated the purpose of the meeting as being to emphasize the need of gardening as a necessary part of the war effort, to stimulate interest, and to explain the various ways in which the Botanic Garden is prepared to cooperate. The program continued as follows:

1. *Defense Stamp Talk.* Mrs. Tremper Longman, Speakers Bureau, Kings County Defense Bond Committee
2. *Welcome to delegates*
    - *a.* Brooklyn Civil Council, Mrs. John H. Jackson
    - *b.* American Women's Voluntary Services, Mrs. Harold D. Vernam
    - *c.* Response, Mrs. E. C. Blum (Member, Brooklyn Botanic Garden Woman's Auxiliary), Chairman Victory Garden Committee of the Brooklyn Civilian Defense Volunteer Office
    - *d.* Response, Mr. George E. Burkhardt, County Agent under Cooperative Extension Work in Agriculture and Home Economics, State of New York.
3. The Brooklyn Botanic Garden Program in the Victory Garden Movement, Miss Ellen Eddy Shaw, Curator of Elementary Instruction
4. Illustrated Talk on Victory Gardens, Mr. Montague Free, Horticulturist
5. Announcements. Printed Announcements of Courses distributed: Registration for Courses

Two hundred and forty-six men and women registered for the Special Victory Garden course, which began Monday, March 9, at 11 a.m., and continued through April 6, the lectures being given by Mr. Montague Free and Miss Margaret M. Dorward.

### *Victory Garden Courses*

*Spring Courses.* A total of nine courses were offered during the spring, planned with special reference to the Victory Garden needs. Five were for the general public, and four were specially for teachers, but were open also to the public. Some 455 persons were registered in these courses.

*Fall Courses.* One hundred and fifty-seven persons were registered in the five Fall Courses planned specially as part of the Victory Garden program, making a total of 613 persons registered for the year in Victory Garden Courses in addition to those registered in other courses.

### *Extra-Mural Victory Garden Talks*

Members of staff have given seventeen Victory Garden talks outside the Botanic Garden in cooperation with institutions and organizations.

### *Victory Garden Broadcasts*

Radio Broadcasts, over WJZ and WNYC, were given by members of the Garden Staff on the general subject of Victory Gardens.

### *Victory Garden Leaflets*

The New York State College of Agriculture and Home Economics, Ithaca, has published a series of six *Leaflets* on Victory Gardens in cooperation with the U. S. Department of Agriculture and others, and the Brooklyn Botanic Garden arranged to distribute 1500 copies of each to its members and others. These *Leaflets* were mailed under franking privileges. Each one was stamped "Distributed by Brooklyn Botanic Garden."

*Special Botanic Garden Leaflets* were published by the Garden as follows: "National Victory Garden Program (Series XXIX,

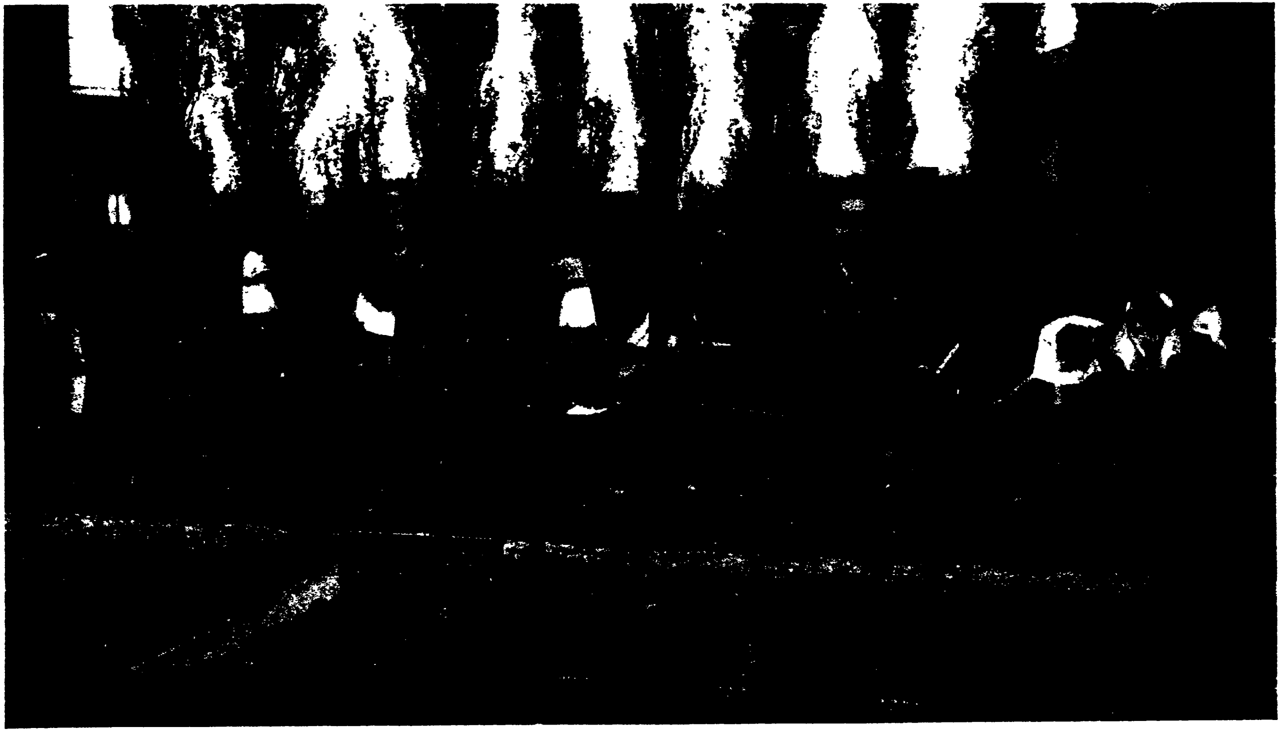

Fig. 2. Planting the Children's Garden. Portion of demonstration Victory Garden in foreground. May 2. (Photo. by V. L. Van Horne.) Cf. Fig. 3

No. 1–2, February 18), and "The Victory Vegetable Garden (Series XXIX, No. 5, April 8). Approximately 1500 of each of these were distributed to members and others.

### *Model Victory Garden*

In April a Model Victory Garden of nearly 2,500 square feet, including both vegetables and flowers, was installed in the southern part of the Children's Garden plot, near the Richard Young Gate. This is described in detail in the appended report of the horticulturist, Mr. Free (p. 110), who planned and installed it. The vegetable plot was surrounded by a border of ornamentals planned and supervised by Miss Dorward. This garden was intended to serve as a model for a "backyard" garden, with suggestions for ornamentals where the available area is sufficiently large. This garden itself and the contents were thoroughly labeled and, judging from the number of people who stopped to inspect it throughout the season, served a very useful purpose and was much appreciated. As stated by Mr. Free (p. 110), he and Miss Dorward were on duty there Tuesdays, Thursdays, and Saturdays from 2:30 to 4:30 p.m., and Wednesdays from 6 to 7:30 p.m., to answer questions asked by the public and give general advice concerning the raising of vegetables and ornamentals.

### *Air Raid Protection*

*Reported by Dr. George M. Reed*

"In January a committee was appointed consisting of Dr. George M. Reed, Mr. Thomas A. Donnelly, Dr. L. Gordon Utter, and Mr. Frank Stoll, to develop plans for protection against air raids. Decisions were necessary in view of the fact that we have not only a Laboratory Building, with large conservatories of glass, but also extensive grounds.

"Plans were made for the building in the case of an air raid. The members of the staff and attending classes are instructed to proceed to the corridor on the street floor, as the most sheltered place in the building in case of bombing.

"Members of staff have been assigned to particular duties at specific locations. Groups have been assigned at each end of the main floor of the Laboratory Building, on the street floor, and in the workrooms beneath the conservatories. Within the building, means for protection have been provided. Twenty Civilian Defense Cabinets containing two pails of sand, bags of sand, a long-handled shovel, and hoe, have been distributed in accessible places in different parts of the building. Pumps on the spraying apparatus have been found satisfactory for supplying water under pressure. These have been distributed where it will be possible to supply water in the attic as well as on the main and street floors of the building.

"The grounds constitute a distinct problem. All people in the open, in the case of an air raid warning, are instructed to seek shelter. Since the Laboratory Building is not at all adapted for taking in visitors, they are instructed by signs to leave the grounds at once and find shelter in the apartment houses and schools on Washington Avenue, Eastern Parkway, and other nearby places. To some extent, the large shelter of the Brooklyn Museum building and the Public Library, as well as the Union Temple, are available.

"In the case of an air raid warning, one of the most important things is to clear the conservatories of visitors, which might be one of the most dangerous places in the case of bombing or the firing of guns. Following the evacuation of the greenhouses, the next problem is to assist the public in getting away from the Garden. With this in view, the various members of the staff have been assigned specific duties and positions in order to facilitate the exit of the public."

*Air Raid Wardens.* Three members of the personnel took the required training and qualified as Air Raid Wardens in the sections where they reside.

*Auxiliary Firemen.* As recorded in the preceding Annual Report, twenty-four men took the required training given by members of the New York City Fire Department and qualified as members of the Fire Department Emergency Auxiliary Corps.

*Red Cross First Aid.* Fifteen of the twenty-two women members of our personnel took the Red Cross Standard Course of ten two-hour lessons. Four of the fifteen have also received certificates for the Advanced First Aid Course.

### *Books for Soldiers*

The Librarian, Mr. Jordan, who took charge of the collecting and sending of books for the libraries established at Camps and United Service Organization canteens, reports that members of staff and their friends contributed 229 volumes.These books, ranging from works on the history of the navy, modern science texts, and history books, to classic and modern English literature, poetry, and detective stories, were forwarded to headquarters, all as reported in the appended report of the Librarian (p. 114). "Ten million books for the boys in service," with a quota of one million books from Greater New York City, was the aim of this campaign, which opened January 12, sponsored by the American Library Association, the United Service Organization, and the American Red Cross.

### *Shrubs and Trees for Army Camps*

Eighteen Army Trucks came to the Garden on April 22 and 25 and were given 126 trees and shrubs and a quantity of perennial herbs for planting at nondesignated army camps. Three units of the 38th Brigade of Brooklyn were supplied.

### *Enrollment of Civilian Defense Volunteers*

In April arrangements were made through Miss Isabelle Henne, of the Prospect Heights Branch of the Brooklyn Office of Civilian Defense (O.C.D.) Volunteer Office, to enroll people at a table on our grounds. On Sunday, April 26, thirty-five persons registered. Of these, thirteen volunteered as blood donors. Eleven other services were represented, including Nurses Aides, P.B.X. Switchboard Operators, Seamstresses, Stenographers, Typists, Teletypist, Receptionists in Hospitals, Canteen Workers, Braille Experts, Radio Telegraphers, and Housing Expert. On Saturday and Sunday, May 2 and 3, forty-five registrations were taken making a total, for the two Sundays, of 80 registrants.

### *Sale of Defense Stamps and Bonds in the Garden*

Early in May arrangements were made with the Kings County War Savings Staff, through Mrs. Thomas Sturgis, to sell Defense

Stamps and Bonds in the Garden on Sundays throughout the summer, beginning on May 17, and ending on September 6. Mrs. J. Shapiro, of the Women's Division, was Chairman of Booths. A booth, centrally located, was set up in the Garden on each Sunday when the weather permitted. The sales averaged between $75 and $100 a Sunday.

*Victory Bonds.* Of a total of 64 employees of all classes, 36 have registered for the purchase of Victory Bonds. The amount paid in was $2,411.75. Of the "G" Bonds, members of staff purchased $2,500.00 worth during 1942.

### *Miscellaneous*

*The New York Victory Garden Harvest Show* was held at the Grand Central Palace September 21–23, combined with the 28th Annual Show of the American Dahlia Society, and with the Horticultural Society of New York, the Brooklyn Botanic Garden, the New York Florists Club, the American Association of Nurserymen, the Florists Telegraph Delivery Association, the Society of American Florists and Ornamental Horticulturists, the Men's Garden Club of America, and the Metropolitan Retail Florists Association cooperating. The Botanic Garden installed an exhibit of fruits of nearly 200 trees and shrubs growing in the Garden. A special section included fruits poisonous to the touch or to eat. An account of the show, in the *Florists Exchange* for September 26 (p. 12), stated that, "The Brooklyn Botanic Garden was represented by the most comprehensive exhibit of berried trees and shrubs ever staged at any exhibition in our memory." For its exhibit the Garden received a gold medal award.

*A Victory Garden Exhibit* was installed in the Ingersoll Memorial Public Library (Grand Army Plaza) from April 9 to 20. This included a number of flats showing the growth of seedlings of several vegetables, and how to plant them; also tools required for a home garden, and posters done by the staff artist of the Library, Mr. Gerhard R. Beyer. The Library displayed books on gardening. The exhibit was seen by several thousand persons. The Library staff entertained the Botanic Garden staff at tea on the ninth.

*Fingerprinting.* Early in September the Garden received from Mayor LaGuardia a request that all employees be fingerprinted for War Emergency Identification. All employees cheerfully complied and the matter was taken care of by our business office. The records were forwarded to the office of the Mayor.

*New York Naval Hospital.* Bouquets of flowers have been sent once a week throughout the season to this hospital, located at the Brooklyn Navy Yard. These flowers came from the flower border of our model Victory Garden. Many potted begonias were also brought into bloom at Christmas for this same hospital.

*The Office of War Information* was supplied with information on the general subject of the proposed utilization of native wild plants of various European countries for food.

*Fort Tilden,* New York (C. L. Malaspina, Captain) was supplied with a quantity of plants and palm leaves for decoration for a dance held on October 10.

*Camp Upton,* Suffolk County, Long Island (Hans C. Jesperson, Lt. Col. Infantry, Commanding) was supplied on May 29, with about 2000 ornamental plants for the planting of a flower garden. Previously we supplied seeds of 25 kinds of flowering plants for the same garden.

*About two tons of scrap metal* were delivered on October 28, to the Department of Purchase of the City. This included discarded garden tools and implements, and hundreds of cuts that have been used during the past twenty-five years or more to illustrate our publications.

*The Civilian Defense Volunteer Office* was provided with germinated seeds of corn, wheat, and other cereals for use in a salad to be used at a luncheon to be given by that organization at the Hotel Wellington, Manhattan, November 18 (Mrs. Irvin Bussing, Chairman, Consumers Committee).

*The Service Club Library* (U.S.O.), Fort Hamilton, Brooklyn, was supplied with a quantity of ornamental plants the latter part of October by the Department of Elementary Instruction.

## TRUSTEE MEETING AT THE GARDEN

It was an inspiration of the newly elected president of the Board of Trustees, Mr. Adrian Van Sinderen, to arrange a series of Trustee meetings on three successive months—April, May, and June, each meeting being given over to one of the three Departments of the Brooklyn Institute of Arts and Sciences, each program being devoted to the work of the given Department.

The meeting on April 9, was held, as usual, at the Brooklyn Academy of Music, and was devoted to a discussion of the history, activities, and status of the Department of Education ("The Institute at the Academy"), by Mr. Van Sinderen and Mr. Julius Bloom, director of that Department. The meeting of May 14, was held at the Brooklyn Museum, when the history, activities, and status of the Brooklyn Museum and of the Children's Museum were presented by the Director, Mr. Laurance P. Roberts and by Mrs. William Lloyd Garrison, III, curator-in-chief of the Children's Museum. The work of the two museums was illustrated by special exhibits, and curators of the Museum staffs were present to answer questions and explain the work of their several departments.

The Botanic Garden meeting was held on June 11. The history, organization, and work of the Garden were presented by the director, with lantern-slide illustrations. The talk was followed by an inspection of the main floor of the Laboratory Building, including the Library and Herbarium, and a special exhibit to illustrate the various scientific and educational activities of the Garden, installed under the general supervision of a committee of the Staff, of which Dr. George M. Reed was chairman.

## INTER-DEPARTMENTAL INSPECTIONS

At the suggestion of President Van Sinderen, arrangements were made for "behind-the-scenes" inspections of the Brooklyn Museum by the Botanic Garden personnel, and of the Garden by the Museum personnel. The inspection of the Garden took place on April 30, attended by about fifteen members of the Museum personnel, who were met at the Eastern Parkway Gate at 3:30 p.m. by Botanic Garden guides, and inspected the Wall Garden, Horticultural Section, Local Flora Section, and Cherry Walk, on their way to the building. Special indoor exhibits were installed by the various departments of the Garden. The itinerary included the seed-room, where seed packets are prepared for the public schools, the storage room for periodicals, the herbarium, library, cases for lantern slides and negatives, Children's Club room, the three instructional greenhouses, conservatory houses 1–6, wood-working room, label room, and propagating houses, outdoors, the experimental garden, Children's House and garden, and the newly planted Victory Garden.

On June 4, the Garden personnel were conducted by Museum guides on a most interesting "behind-the-scenes" inspection of the Museum.

## RESEARCH

The advancement of botanical science by research is one of the obligations imposed upon the Garden by the terms of the *Agreement* between the City of New York and our Board of Trustees in establishing the Garden, and by the laws of the State of New York [1] authorizing the city to enter into that agreement.

The direction which research takes may be determined exclusively by the major interest or enthusiasm of the investigator, or it may be determined by the need to ascertain some principle or fact for practical application. There are all degrees of overlapping of these two aims. The all important thing is to make sure that research is continued and encouraged; to this end it is essential, says President Conant, of Harvard, that "a large body of influential citizens must have a passionate interest in the growth of human knowledge." Where and to what extent this condition is realized it is not easy to say. One of the great needs of the Botanic Garden is a more widespread interest in our research, especially on the part of those in a position to promote it. We have still no endowment fund for the express purpose of supporting investigation, which is a fundamental activity of the Garden. So far, the work has been chiefly supported by generous annual contributions of private funds.

The urgent need, growing out of the war, of increasing the supply of food, fibres, and medicines emphasizes the importance of a better understanding of all aspects of plant life, e.g., plant nutrition, plant diseases, genetics and plant breeding, and plant geography, so that research along applied lines may be planned and carried out more efficiently, with a view to meeting the needs of the war and of the difficult post-war period.

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[1] Laws of New York, 1897. Chapt. 509. Approved by Gov. Frank S. Black, May 18, 1897. (Amended, 1906 and 1911.)

Reports of progress in various research problems at the Garden during 1942 are given on pages 75–84. One hardly needs to stress the importance of investigations of plant diseases. Results of such studies, conducted at the Garden during the past thirty years, have not only had wide practical application, but the annual cost of maintaining our horticultural collections is greatly increased by plant diseases that necessitate unceasing attention, the purchase and application of insecticides and fungicides, and the frequent replacement of woody and herbaceous plants that have already required skilled labor in planting and cultivation, not to mention the marring of the beauty of the plantations and their educational impoverishment that may result from the ravages of plant diseases. These may, at times, require years to correct, as when a few years ago, a young Red Elm (*Ulmus serotina*) in the Garden, after several years of care, had to be cut down and burned because it was found to be infected by the disastrous Dutch Elm-disease. Throughout the park systems of our cities such casualties occur constantly, entailing annual losses of tens of thousands of dollars. See also, on page 77, the report of our loss of Iris through "root-rot."

## THE PLANTATIONS

*Maintenance.*—"What I aspired to be, but am not, comforts me," wrote Browning. Whatever may be true of an individual, a botanic garden can derive little, if any, comfort in having aspired to perfect maintenance from its beginning, but having never been able closely to approximate that ideal, solely because sufficient funds have never been available to make perfect maintenance possible.

Of a staff of twenty-two gardeners, two give all their time and one gives half time in the conservatories; two are required for the experimental garden, which is not one of the public exhibits, leaving seventeen gardeners to maintain fifty acres of intensively cultivated gardens—or only one man for every three acres. *Of course, it can't be done*, and the Garden will never approach more closely to the ideal of proper maintenance until we are able to employ more gardeners.

*The Cherry Trees* along Cherry Walk and the cherries and flowering crabs adjacent thereto, were never more beautiful than during 1942. While they were in flower special studies were made, by Dr. Reed, of their naming, with a view to accuracy of name and to eliminating duplicates, for the trees have now become so large as to necessitate thinning.

The four new rows of flowering cherries, variety *Kwanzan*, 76 trees in all, on the Esplanade, and the six trees of the white flowered "Shirotae," on the Museum embankment, all planted in 1941, came through their first winter without any casualties. During the year bronze tablets were affixed to boulders at each end of each double row to mark "Cherry Lane East" and "Cherry Lane West."

*Local Flora Section.* It was in the Annual Report for 1938 that we published a preliminary sketch by Miss Purdy of the limestone ledge planned by Dr. Svenson for the Local Flora Section. It was not until 1941, that the truckload of limestone, given in 1937 by Mr. Bernhard Hoffman, Stockbridge, Massachusetts, was supplemented by the gift of six more truckloads by Mr. Augustus Whittingham, of Andover, New Jersey, making sufficient rock to construct a ledge similar to the sketch by Miss Purdy. The initial planting of this ledge was done in April, 1942.

The Local Flora Section now has ten well-defined ecological habitats: 1. Acid Bog; 2. Sand Barren (Fig. 1); 3. Pond; 4. Woodland; 5. Serpentine Bank (Fig. 7); 6. Granite Ledge; 7. Plains; 8. Wet Meadow; 9. Brook; 10. Limestone Ledge (Fig. 6). These are all illustrated in Dr. Svenson's *Guide to the Local Flora Section*, published in July.

*Fern Garden.* In the preceding report we noted that a portion of the limestone contributed by Mr. Whittingham was placed in a part of the Fern Garden area on the south shore of the Lake, affording a suitable condition for certain "lime-loving" species. These and other types constitute the initial planting of this garden in 1942.

## PUBLIC EDUCATION

*The New Prospectus.* We have already noted the effect of the war on the nature and content of our educational program for 1942. This is reflected in the educational *Prospectus* published in September, which lists twelve "Victory Garden Courses," specially planned for adults to meet horticultural needs arising from the war effort. For the first time the *Prospectus* has carried halftones to illustrate the nature of the various aspects of our program of public instruction for adults and children.

The prompt registration of nearly 500 adults in the Victory Garden Courses, as soon as they were announced in the special spring folder, was ample evidence of public interest and of the need that was felt for this opportunity. A special design for the front page of this folder by Miss Carroll, of the Department of Elementary Instruction, added much to its effectiveness. Miss Carroll also designed the front cover page of the 1942–1943 *Prospectus* (the October number of the Botanic Garden RECORD).

### *Registration and Attendance at Classes*

The registration of 157 in the fall and winter Victory Garden Courses brings the year's registration in these courses to a total of 455. The total registration for all classes was 1895 (adults, 1296; children, 599). The total attendance at all classes and lectures, including class instruction and talks given at schools, was 73,383. This figure is 43,003 smaller than for 1941, reflecting the effect of war conditions. By a Board of Education ruling, as an air raid precaution, classes from schools have not been permitted to visit museums and botanic gardens during 1942.

### *Adult Education*

*Publication* has included two illustrated Guides to the Garden collections, as follows:

*Guide No. 13. Trees in the Brooklyn Botanic Garden.* 53 pages, 9 illustrations. By Alfred Gundersen and Arthur H. Graves. In this Guide there are listed 130 genera and 620 species and varieties.

*Guide No. 14. The Local Flora Section (Native Wild Flower Garden) of the Brooklyn Botanic Garden.* 27 pages, 18 illustrations. By Henry K. Svenson.

A partial list of *Guides* to the Plantations and Collections may be found on the back cover page of this Report, and a complete list will be supplied on receipt of request by mail or telephone.

*The publication of two special Victory Garden Leaflets* is reported on page 48.

*Periodical Publication.* Six technical and semi-technical articles have been published by members of staff in scientific journals, and some 38 popular articles in newspapers and popular magazines.

*Public lectures and addresses* have been given by 17 members of the Garden personnel—25 at the Garden and 90 elsewhere in Brooklyn and in other boroughs and cities. These addresses are listed on pages 137–144 of this Report.

*Broadcasting* included 18 talks over station WNYC. These included special Victory Garden talks. Two half-year Radio Programs were distributed to members and others.

*Bureau of Public Information.* The Victory Garden movement and other aspects of the war effort have greatly increased the number of inquiries addressed to the Garden on all aspects of plant life and gardening. We have already recorded (p. 50) the special provision for answering inquiries on gardening by having members of staff stationed at the Model Victory Garden.

## *Elementary Instruction*

The Report of the curator of elementary instruction may be found on pages 91–96.

*Aims and Ideals.* In a series of three attractive, illustrated booklets, the members of the Department of Elementary Instruction have presented a survey of the work of the Department as it has developed during the past 29 years. The first booklet, published in June, 1941, entitled *Our Pattern,* contains the following informative statement of the aims and ideals by Miss Shaw, curator of elementary instruction, who initiated this unique and excellent work and who has supervised it from the beginning:

"Our pattern as here set forth includes the following: self-discipline, knowledge at first hand, dignity of labor, financial sup-

FIG. 3. Planting the Children's Garden. Corner of demonstration Victory Garden in foreground. May 2. (Photo. by V. L. Van Horne.) Cf. Fig. 2

port of our own work, generosity, ability to take a command and follow it, and ability to size up ourselves and our endeavors. These are the things that bind us Saturday after Saturday to our work. It is worth while. We are not set up to train gardeners or research men, although, to be sure, gardeners, florists, research men, and botany teachers have come as a result of this opportunity, but we are set up to develop human material. We view our work with sentiment but not with sentimentality."

Of this work, a correspondent from the Pacific coast has written as follows: "The work which you are promoting for the benefit of the children of your city will yield an increment far surpassing anything it costs you. It will yield intrinsic values. It is splendid that you believe in public service—the social aspect of it."

*Seed Packets for School Children.*—Special attention is called to the marked increase in the number of packets of both vegetable and flower seeds distributed to school children as compared to previous years. In 1941, 1,055,158 packets were supplied; in 1942 the number rose to 1,315,653, an increase of 260,495. This is the largest number for any year since the service was inaugurated in 1914, with a total of 25,000 packets distributed. A larger number of vegetable seeds was called for than previously on account of the Victory Garden campaign. The preparation of these packets and the receiving and filling of orders requires a portion of the time of seven regular members of staff, and part time of seven other adults. Members of our Boys and Girls Club also contribute assistance during the year. About one third of the million and a half packets for distribution in 1943 (filled partly during 1942) have been filled by these boys and girls on volunteer time. In this way some of the boys and girls work out the small fees charged for children's garden and other courses. It has been estimated that the total "men-days" required in 1942 is equivalent to more than the full time of one person, seven hours a day for somewhat more than one calendar year. This is one of our most appreciated services to the schools.

## The Library

"Only hold up before me a book and you may lead me all around Attica, and over the wide world." The one who said this was Socrates, the city man *par excellence,* he who never went outside the walls of Athens except on military service, or when drawn, as he said, by the "bait of discourse." But when Phaedrus thus lured him out of the city to the banks of the Ilissus he was surprised to discover the beauty of nature and gave himself up wholeheartedly to its enjoyment. One may not learn botany from books alone. The pioneers in plant study were, of course, obliged to get their "botany" wholly without books, for no botanical books were possible until plants themselves had first been studied. But once a literature of a science develops it can never be disregarded by a student of that science; thus a library of pertinent literature becomes an indispensable adjunct of any institution devoted to the advancement of the science.

As the librarian has pointed out, the library of the Brooklyn Botanic Garden, starting with a gift of only nine books, as of January, 1911, now has nearly 23,000 bound volumes and more than 21,000 bound pamphlets, exclusive of the American Fern Society Collection, and has nearly reached the capacity of the shelving. This is one of the several needs which, as noted in the preceding report, makes an addition to our building increasingly urgent.

*The American Library Association* continued its subscriptions to the journals *Ecology* and *Genetics* (published by the Garden) for foreign subscribers for delivery after the war. The amount of these pre-paid subscriptions was $300 for *Ecology* and $330 for *Genetics.*

*Air raid precautions* were made early in the year. It was decided not to remove any of the publications until danger from air raids became more imminent, but suitable boxes were specially made in our own wood working room for the removal and protection of the incunabulae and later pre-Linnaean volumes and other rare and expensive or irreplaceable items. Arrangements were also made for the storage of these boxed items in a "bombproof" vault. During the year no occasion arose indicating immediate danger and so no removals were made.

## HERBARIUM

Dr. Svenson reports the addition of 2,898 specimens to the Phanerogamic Herbarium, and 3,456 to the Cryptogamic Herbarium, including 700 received by gift and 1,605 by exchange. Through lack of adequate help a great many specimens remain unmounted. As in the case of other aspects of our work, a substantial endowment fund is greatly needed exclusively for herbarium purposes. The nucleus of this endowment now amounts to only $4,000.

## COOPERATION

In addition to cooperation with various governmental and civic war organizations, recorded on pages 45 and 54, the Garden has cooperated during 1942 with the following organizations and agencies:

### *U. S. Department of Agriculture*

Through the *Bureau of Plant Industry*, in connection with the plant disease investigations reported by Dr. George M. Reed on page 75 and following.

### *State Agricultural Experiment Stations*

Several in connection with Dr. Reed's work, and the Connecticut Station in connection with Dr. Graves's work with the chestnut disease.

### *New York State Institute of Applied Agriculture*

Supplied with 450 scions of flowering cherry and 50 of wisteria, as reported by Mr. Free.

### *Board of Higher Education*

On recommendation of the Committee on Prizes and Scholarships of the Department of Biology of Brooklyn College, the annual scholarship in Botanic Garden Classes, awarded for superior work in biology, was awarded in May to Miss Caroline Aaronson. The fall award was not made.

The biology classes of the four colleges of the City College group (City and Hunter Colleges in Manhattan, Brooklyn College, and Queens College) were supplied, as usual, with considerable living plant material for laboratory study.

Dr. Ralph C. Benedict, of Brooklyn College, has continued, for the twenty-seventh year, as resident investigator with special reference to ferns. In his appended report (p. 117) he records further cooperation between the Garden and the College.

### *Board of Education*

The discontinuance of visiting classes in anticipation of air-raid danger has already been noted. What this means in loss of opportunity to the schools may be indicated by the attendance figures for 1941—1,118 classes, with total attendance of 73,688.

*Spring and Fall Posters* were distributed to the schools announcing fourteen talks for the spring season and nine for fall and winter. Requests for talks exceeded the capacity of our personnel. A similar poster was distributed to High Schools of all boroughs of the city, listing sixteen talks.

Miss Shaw and Miss Miner cooperated with Mr. Marvin M. Brooks, director, by assignment, of Nature Garden Work, in giving course B5, Nature-Garden Science, offered in conjunction with the Board of Education.

*The 100th Anniversary of the Board of Education* was celebrated in April, 1942, and the Botanic Garden, at the request of the Board, installed at the Laboratory Building an extensive exhibit illustrating our cooperation with the schools since the Garden was established more than thirty years ago.

### *The Torrey Botanical Club*

The Torrey Botanical Club, the oldest botanical organization in the United States, was organized in 1867. During the week of June 22–27 the Club celebrated its seventy-fifth anniversary. The director of the Botanic Garden happened to be president of the Club on this anniversary year, and opened the first meeting, which was held in Brander Matthews Hall, Columbia University, on Monday afternoon, June 22. He also presided as toastmaster at the anniversary dinner, held at the Men's Faculty Club, Columbia, on the evening of the twenty-second.

The sessions on Tuesday were held at the New York Botanical Garden, Bronx Park, and those of Wednesday at the Boyce

Thompson Institute for Plant Research, Yonkers, N. Y. On Wednesday evening at 8:30 p.m., the director presided at a public meeting, held at the American Museum of Natural History, in Manhattan, when Dr. William J. Robbins, director of the New York Botanical Garden, gave a popular address on the subject, "Plants need Vitamins, too."

The morning and afternoon sessions of Thursday, June 25, were held at the Brooklyn Garden, with programs as follows:

10:00 a.m. to 12:30 p.m.

"The History of the Brooklyn Botanic Garden." Dr. Gager.

1. "Genetics, the Unifying Science in Biology." Dr. George H. Shull, Princeton University, Princeton, New Jersey.
2. "A Consideration of Criteria of Center of Origin." Dr. Stanley Cain, University of Tennessee, Knoxville, Tennessee..
3. "The Status of Plant Pathology in 1876 and in 1942." Dr. George M. Reed, Brooklyn Botanic Garden.
4. "Technical Applications of Genetics in Plant Breeding in 75 Years." Dr. A. F. Blakeslee, Carnegie Institution of Washington, Cold Spring Harbor, Long Island, New York.

12:30 to 4:30 p.m. Luncheon. Brooklyn Museum. 50 cents. Inspection tours of Botanic Garden and laboratories, conducted by members of the Staff.

The following members of staff were appointed official delegates to the celebration: Ralph H. Cheney, representing the Botany Department of Long Island University; C. Stuart Gager, representing the New York Academy of Sciences; Arthur Harmount Graves, representing the Brooklyn Botanic Garden.

### *Long Island University*

Dr. Ralph H. Cheney, professor of biology at Long Island University, has continued for his twelfth year as Resident Investigator at the Garden with special reference to economic plants. Dr. Cheney gave one of the five lectures (on Herb Teas) in Course V3, "Herbs: Their cultivation and uses."

### *International Flower Show*

The Garden's exhibit at the annual International Flower Show, at the Grand Central Palace, March 16–21, was a demonstration of Graftage in all its aspects. The exhibit, which proved very popular and educationally effective, was given a gold medal and a special cash award of $500.

In connection with the exhibit, the horticulturist, Mr. Free, who planned it and supervised its installation, prepared a special *Leaflet* (Series XXIX. No. 3–4) on "The art of graftage." This was distributed free at the Show to those who asked for it.

## *Hospitals*

*Nurses Training Classes.* On account of the extra demand for nurses, owing to the war, all hospitals were obliged to discontinue for the duration the attendance of nurses training classes for the work we have specially planned for them and given regularly during the past sixteen years. The total enrollment of nurses in these classes in 1941 was 232.

*Queen's General Hospital* (Municipal) at 161st Street and 82nd Drive, Jamaica, Borough of Queens, was given 18 shrubs for planting the Hospital grounds.

*Triboro Hospital* on the same grounds as Queens General (Parsons Blvd. and 82nd Drive, Jamaica) was given 1,100 ornamentals.

## *Miscellaneous*

*New York Zoological Park.* Mr. Free reports that on two occasions fresh bamboo shoots were provided for feeding the giant pandas, and in addition 40 clumps of hardy bamboo for planting at the zoo under the supervision of our foreman gardener, Mr. George Bishop.

*Metropolitan Museum of Art.* A quantity of living plant material was supplied for an exhibit to illustrate Chinese life and art.

*The Garden Club of America* was supplied with miscellaneous plant material for their exhibit on plants in war work.

*The Garden is under special obligation to* Miss Martha Louise Grant, who collaborated with Mrs. Henry K. Svenson in giving the lecture and demonstration on "The Use of Herbs in Cooking," on November 9. This was the second lecture in Course V3, "Herbs: Their Cultivation and Uses."

We are also under obligation to Mr. Clarke E. Davis, vice president and technical director of the Virginia Dare Extract Company, Inc., for giving on November 16, the third of the five lectures in that course. His subject was, "Distillation from herbs, with demonstration."

## WOMAN'S AUXILIARY

On Thursday afternoon, April 16, the Woman's Auxiliary gave an indoor garden party and tea in the Laboratory Building. Mr. John H. Storer showed his superlative motion picture film, "Wings and Flowers," in the Auditorium. This was followed by about 40 exhibits, in the Rotunda, of Flower Arrangements and table settings by representatives of garden clubs and other individuals.

At the Spring Meeting of the Auxiliary, on May 4, at the Laboratory Building, the guest of honor was Miss Mary Averill, honorary curator of oriental gardening and floral art. By request, Dr. Gager gave a brief history of the Oriental Garden and of the services in connection therewith of Miss Averill, who has spent the larger part of her life in Eastern Asia and Japan, and while there made a special and prolonged study of flower arrangement and oriental gardening. In recognition of her twenty-four years of service the Auxiliary presented here with a beautiful scroll, and a purse of $500. The scroll was designed by Miss Michalena LeFrere Carroll of the Garden personnel.

The Auxiliary also had charge of the serving of tea at the twenty-eighth Annual Spring Inspection of the Garden on Tuesday, May 12, and at the fifteenth annual Rose Garden Day, Tuesday, June 9.

## ANNUAL SPRING INSPECTION

The twenty-eighth Annual Spring Inspection was held as usual on the second Tuesday in May, which fell on May 12. About 450 members and their friends attended, and the weather was ideal. As noted elsewhere, the serving of tea was in charge of the Social Committee of the Woman's Auxiliary, of which Mrs. Edwin H. Thatcher is chairman. About fifteen groups of guests were taken on the tour of the grounds, which included the model Victory

Garden, Children's' Garden, Rose Arc, New Iris Garden on the Esplanade, and the "V" and . . . —" garden, in red, white, and blue petunias at the south end of the Esplanade.

The indoor features included an exhibit illustrating the service rendered by the Garden to the public elementary and high schools of the city from 1910 to 1942, assembled at the special request of the New York City Board of Education, in connection with the celebration of its centennial. Among other exhibits it was shown that since the Garden was established in 1910 its lectures and classes have been attended by more than 2,500,000 pupils and teachers. This exhibit was first opened to school officials and teachers on April 13, and illustrated in a striking manner the extent and variety of this service, which is one of the many ways in which the Botanic Garden has been able to serve various City Departments and the general public during the preceding 31 years.

There was also an exhibit of 30 photographic enlargements, by Mr. Tet Borsig, of trees and other Long Island Vegetation. Also a Library exhibit of recently acquired pre-Linnaean and other rare or important publications.

The curator of public instruction records (p. 88) five "Flower Days," three in the spring and two in the fall. The total attendance was approximately 440.

## MEMBERSHIP

Of what advantage to me is membership in the Botanic Garden? This is, perhaps, the question most commonly asked when the matter of membership in the Garden is presented. Naturally and properly. But there is another aspect to membership in our botanic gardens and museums. It is the purpose of these institutions to serve the public, and they have a right therefore to look for support, not alone from public funds, but from individuals who may benefit directly or who are interested in the cultural life of their community. It is from both points of view that the Botanic Garden appeals for support in the way of membership.

It was never more important than now to maintain this beautiful garden for rest, recreation, and release from the strain of war, as well as for its scientific and educational features and general public service. Special activities along various aspects of the war effort are extensive and important, as already noted. It should be a definite part of this effort to maintain and improve the characteristic features of our American civilization; it is primarily for this purpose that the United States entered the war. This is one of the reasons for maintaining *now* our support of museums and botanic gardens. This has become not only a privilege or opportunity but, in a democracy, a social obligation.

The total number of members (as of April 9, 1943) is 939, compared with 994 as of April 25, 1942. The list of members may be found on pages 153–164 *infra*. The decrease, of course, reflects the financially difficult times through which we are passing, and absorption of interest in wartime activities. It is appropriate to register here the fact that, notwithstanding the falling off in number of members, the demands of the public for such service as the Garden renders have been increasing steadily during the past few years, and notably in 1942.

About 8,000 herbs and vegetable plants were distributed to members who called for them on May 15. Special information was given by mail, 'phone, and personal conference to many members interested in the general subject of victory gardens for themselves and organizations.

*Club Memberships.* The special opportunities offered to Garden Clubs who enroll as members of the Garden have been taken advantage of by about 25 clubs. For many years the Botanic Garden has cooperated in numerous ways with scores of garden clubs, in this and other states, and club membership in the Garden is a logical sequence to this. The advantages of Club Membership are explained on page iii preceding this Report.

## PERSONNEL

*Dr. James G. McDonald,* who became president of the Brooklyn Institute of Arts and Sciences on April 14, 1938, succeeding Mr. Edward C. Blum, who then became chairman of the Board, resigned as of March 1, 1942.

*Mr. Adrian Van Sinderen,* who was third vice-president of the Board of Trustees from 1928–1931, second vice-president from 1921 to 1942, and chairman of the Finance Committee of the Board from 1924 to 1941, was elected president of the Institute, effective as of March 1, 1942. Mr. Van Sinderen is son-in-law of the late Mr. Alfred T. White, to whom the establishment of the Brooklyn Botanic Garden was chiefly due.

*Miss Michalena LaFrere Carroll,* because of the war, did not resume her teaching, as during the past few years, at the Southern Cultural Institutes, Blue Ridge, North Carolina. She remains, however, a member of the Advisory Committee of five which has general supervision of these summer courses.

*Mr. Thomas A. Donnelly,* who became Secretary and Accountant on August 1, 1939, has been granted leave of absence, beginning April 1, 1942, for service with the armed forces. He was assigned as Technician, Headquarters Detachment, Army Base, Port of Embarkation (57th St. and 2nd Ave., Brooklyn). This assignment to a post in Brooklyn has made it possible for him to give certain night services and supervision to the work of the Business Office for which he has been granted a nominal compensation by the Governing Committee.

*Dr. C. Stuart Gager,* who was given the Arthur Hoyt Scott gold medal and cash award in 1941, received the gold medal at the dedication of the Arthur Hoyt Scott outdoor amphitheatre on the campus of Swarthmore College on Saturday, May 23. He was asked to give the dedication address for the amphitheatre, and this was published in *Science* for June 26, 1942.

During the year Dr. Gager continued to serve as vice-chairman of the board of the Horticultural Society of New York, as vice-president of the National Institute of Social Sciences, as a member of the Council of the New York Academy of Sciences, and as president of the Torrey Botanical Club (January 1–December 31), as noted elsewhere in this Report (p. 65).

In the spring of 1942 the board of trustees, faculty, and graduate council of Princeton University adopted a plan for "Advisory Councils" for each department or academic division designated for such purpose by the president of the University. It has been provided that, "each advisory council shall have official status and its membership shall be listed, along with other constituent Princeton groups, in the University Catalog." The members are to serve for a term of three years, except that of those first appointed, one-third shall serve for one year, one-third for two years, and one-third for three years. Dr. Gager was appointed by President Dodds for a two year term, and on March 18 he attended the first meeting of the Council at Princeton.

*Miss Lorraine LaRoche,* appointed stenographer in the Business Office beginning February 16, resigned October 31.

*Miss Frances M. Miner* was elected president and editor of the Department of Garden Education of the National Education Association beginning September 1.

*Miss Fay D. Montross,* on November 1, became assistant in the Business Office, in place of Miss Lorraine LaRoche, resigned.

*Mrs. Edna Palmitier Schacht,* assistant secretary in the Business Office since July 1, 1939, was made Acting Secretary beginning as of April 1, during the temporary absence of Mr. Thomas A. Donnelly, as noted above.

*Miss Elizabeth Remsen Van Brunt,* for several years a member of the Woman's Auxiliary of the Garden, was made Honorary Curator of Culinary Herbs beginning as of April 1, 1942.

## FINANCIAL

### *Gifts*

A list of the gifts of funds, publications, plants, and other objects may be found on pages 122–131. These have all been acknowledged as received, with the thanks of the Governing Committee and the director.

### *Public and Private Funds, 1942*

The total operating budget for *the calendar year* 1942 was as follows, with comparison for 1941:

| | *1942* | *1941* | *Change* |
|---|---|---|---|
| Tax Budget Funds (49.39%) | $ 91,830.67 | $ 93,308.57 | −$1,477.90 |
| Private Funds (50.61%) | 94,099.09 | 88,957.73 | + 5,141.36 |
| Totals | $185,929.76 | $182,266.30 | +$3,663.46 |

For the past eight years the percentages of the two budgets have been as follows:

| | *1935* | *1936* | *1937* | *1938* | *1939* | *1940* | *1941* | *1942* |
|---|---|---|---|---|---|---|---|---|
| Tax Budget | 48.3% | 49.1% | 49.8% | 43.73% | 48.2% | 51.72% | 51.19% | 49.39% |
| Private Funds | 51.7% | 50.9% | 50.2% | 56.27% | 51.8% | 48.28% | 48.81% | 50.61% |

## *Functional Allocation of Income*

The question is sometimes raised as to how the Botanic Garden funds are expended as between the several aspects of our work. This is indicated, in amounts and percentages, for *the fiscal year* July 1, 1941 to June 30, 1942, as follows:

| *Purpose* | *Amt. Expended* | *Per Cent.* |
|---|---|---|
| 1. Horticulture | $ 75,697.05 | 44.49 |
| 2. Public Service (All aspects of our educational work) | 50,565.30 | 29.72 |
| 3. Administration | 22,244.50 | 13.07 |
| 4. Botanical Science (Research and related activities, part of which are also educational) | 21,630.52 | 12.72 |
| Totals | $170,137.37 | 100.00 |

Item one, above, includes the cost of maintaining the plantations and conservatories. This is as much a part of "public service" as any other phase of our work, for of course the plantations, with all their horticultural diversity and beauty, are maintained primarily for the pleasure and instruction of the public, and for no other purpose. At the cost of tireless iteration it may be noted here also that item 4, Botanical Science, should, in part at least, be included under Public Service, for a portion of our research is essential to the maintenance of the living plants in health.

## *Endowment and Endowment Income*

The total of all endowment funds, as shown by the appended Financial Statement (p. 119), is $1,387,849.55. Of the total Private Funds Income of $82,736.01 for 1942, $48,469.68 represents income from endowment, as against $48,394.77 for 1941. Private Funds income from other sources, which fluctuates from year to year, was $34,266.33. During 1942, $1,197.96 have been added to the Endowment Fund principal.

The Ellen Eddy Shaw Endowment Fund, for the Department of Elementary Instruction, continues to grow by very modest increments, and is now $24,373.67, as against $24,332.67 in 1941.

## *Improvement in Salaries and Wages*

In several preceding reports I have recorded the great injustice in the Tax Budget appropriation for the wages of our per diem men, allowing only $4.50 a day for experienced and valuable employees, several of whom have been at the Garden for many years. This is not only less than the rate generally prevailing for similar work, but is less than has been paid for some time in the Department of Parks through which the Garden articulates with the City. Three of our per diem men left during the year for better paying positions elsewhere.

As a result of renewed representations made by President Van Sinderen, supporting those of the director, a rate of $5.00 a day for each of the present force was approved by the Budget Director, and the sum of $2,000 was made available, as of July 1, 1942, in addition to the original appropriation for wages, to provide for the fiscal year July 1, 1942–June 30, 1943, "for not more than 14 men at not more than $5.00 a day. Thus, although the compensation is improved, we are still left with only 17 gardeners to maintain 50 acres of gardens—one man for every three acres, as noted on page 58.

A supplementary Tax Budget appropriation of $2,400 was also voted to provide for an increase, beginning July 1, of $120 per year for those receiving salaries of less than $1,900. Only $2,000 of this appropriation was made available.

The director wishes to express his personal appreciation for the helpful cooperation of the Botanic Garden Governing Committee, the President and other members of the Board of Trustees, to the Woman's Auxiliary, to the Garden personnel, and to all others who have cooperated during the year, by gifts and otherwise to facilitate the important work which the Garden is rendering to this community and to botanical and horticultural science and education. He also ventures to express the hope that, in the not too distant future funds may become available to make possible a provision for suitable retiring allowances for those who have served the garden long and faithfully.

Respectfully submitted,

C. STUART GAGER,
*Director.*

# REPORTS ON RESEARCH FOR 1942

## Plant Pathology

By George M. Reed

### *Physiologic Races of the Oat Smuts*

Physiologic specialization of fungous pathogens complicates the development of resistant varieties of useful plants—vegetables, cereals, fruits, and ornamentals. New hybrid combinations of desirable qualities with resistance to a particular race of pathogen may be obtained, only to discover that strains of the latter have originated which also attack the new varieties. Victoria oats was introduced from South America in 1927 by the United States Department of Agriculture, and has been used extensively in oat breeding work by Mr. T. R. Stanton, Senior Agronomist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, Washington, D. C., and cooperators in several State Agricultural Experiment Stations. Crosses have been made between Victoria and other oat varieties from which many selections have been made, some adapted to the South and others to the Central West oat-growing sections. In our studies, Victoria has been inoculated with most of the races of loose and covered smut and found to be resistant. However, the discovery of a race of loose smut of oats which attacks Victoria creates a new set of problems.

Seed of many of the new promising selections of hybrids of Victoria and other oat varieties was forwarded to us by Mr. T. R. Stanton for testing with the new race of smut. Altogether, 45 selections of Lee × Victoria and 8 selections of Hairy Culberson × Victoria were tested and found to be susceptible. In these hybrids, both parents used in the cross were also susceptible to the new race of smut. On the other hand, 15 selections of Victoria × Richland were found to be resistant; in these selections we might expect to find some susceptible ones, as well as resistant; however, all of those selected from the standpoint of other qualities proved to be resistant, not only to the new race of smut but to all others with which tested. Two selections of Nortex × Victoria were also found to be resistant. Dr. George J. Wilds, Coker's Pedigreed Seed Co., Hartsville, S. C., sent us many selections of new oat hybrids for testing. Of 38 selections of Victoria × Fulgrain, 11 were resistant and 27 susceptible.

### *Studies on the Inheritance of Smut Resistance*

The second generation plants of oat hybrids involving Victoria and Monarch were grown. These were inoculated with Race 1 of the covered smut, to which Victoria is resistant, while Monarch is susceptible. The data secured indicate a single genetic factor for resistance.

The second generation plants of a hybrid between Markton and Navarro, both highly resistant varieties, were tested; 86 plants inoculated with Race 1 of the loose smut and 84 inoculated with Race 1 of the covered smut gave no infection. The second generation plants of a third hybrid between Markton and Red Rustproof were inoculated with the Red Rustproof race, and out of 136 plants grown 13 were infected (9.5 per cent).

The third generation of these hybrids will be grown in 1943 and doubtless will throw additional light on the factors for resistance involved.

The first generation plants of 33 new oat crosses were grown. These crosses involve various combinations of resistance in relation to the different races of both loose and covered smuts. The data for the second generation plants of many of these will be obtained this coming year.

A number of new crosses were made by Miss Jeanne P. Walther. These are designed to throw further light on the mode of inheritance of resistance to both loose and covered smuts.

### *Studies on Experimentally Produced Physiologic Races of the Oat Smuts*

Dr. L. Gordon Utter, research assistant, carried out further experiments on the reaction of 34 collections of smut resulting from the hybridization of Races 1 of loose and covered smuts. In these experiments 9 distinct races of loose smut and 13 of covered smut were differentiated on 9 oat varieties from 1938 to 1941. The 1942 data indicate that 5 of the remaining collections of covered smut could be separated from the other races by the use of 4 additional oat varieties as differential hosts. In the same way, 3 more collections of the loose smut were differentiated by the use of 3 oat varieties. The differential varieties used were susceptible to Races 1 of loose and covered smut; some of them gave high infections with the new races, while others were free.

### *Soft Rot Disease of the Iris*

The bacterial soft rot disease of iris appeared in the new bearded iris beds in the Esplanade during mid-May, and reached epidemic proportions in July and August. Abundant moisture, warm temperatures, and succulent plant growth appeared to be predisposing factors to this disease. A total of 1,223 rotted plants from an original 3,924 plants were removed from the beds. Many more plants would have been lost if salvage operations had not been undertaken during late July. Even drying the plants in the greenhouse failed to entirely check further rotting.

Infection experiments carried out by Dr. L. Gordon Utter indicated that the rot organisms were capable of inducing the disease through the foliage, rhizomes, and roots. Generally, it was necessary to break the surface of these organs, in a manner suggestive of insect injury, to accomplish rotting.

The rot disease could not be effectively controlled with various sprays and sulfur dust which were applied to the base of the plants or on the foliage. Further experiments have been undertaken to determine the effectiveness of various fertilizers and chemicals in controlling the rot.

### *Experiments on the Control of Iris Thrips*

The methyl bromide fumigations of iris undertaken in 1941 by Dr. L. Gordon Utter, with the cooperation of Dr. Floyd F. Smith and Mr. F. S. Blanton, of the Division of Truck Crops and Garden Insect Investigations, Bureau of Entomology and Plant Quarantine, Washington, D. C., were brought to a conclusion.

The purpose of these investigations was to determine the tolerance of planting divisions of many varieties of bearded and beardless iris, when subjected to methyl bromide fumigations at rates of 2½ or 3 lbs. per 1000 cu. ft. of space for 2½ hours at 68°–76° F.

Treatments were made in April, May, July, and September 1941. Treated and duplicate untreated divisions were planted in field plots for comparing their recovery.

The results from these investigations indicate that no significant differences in average height of plants, mortality, or flowering capacity exist between plants fumigated with methyl bromide at the 2½ or 3 lbs. rates, or between them and the untreated plants for any one treatment period. In general, the treated and untreated plants in the April and May sets showed better recovery, larger and more vigorous clumps, lower mortality, and better flowering. This behavior, however, seems to be directly correlated with the time of year at which the iris were treated and planted.

The demonstrated tolerance of the various iris to methyl bromide, according to the methods used, is of considerable importance. Infested iris plants now can be safely treated with methyl bromide for the eradication of the iris thrips. Furthermore, such treated plants would adequately satisfy the recommended requirements for eliminating Japanese beetle larvae from stock intended for shipment outside of the quarantine areas.

## CHESTNUT BREEDING WORK IN 1942

### BY ARTHUR HARMOUNT GRAVES

This project has been explained in previous annual reports.

*Hybrids of 1942.*—In 1942 most of our second generation Japanese-American hybrids, back crosses and intercrosses, bloomed, being then 5 years old; and, selecting the tallest and most blight resistant of these, we crossed them with each other and also with blight resistant pure Japanese. In all, 21 different crosses were made, using first and second generation hybrids and resistant Japanese. As in previous years, relative disease resistance was determined by inoculations from pure cultures of *Endothia.* At the same time, check inoculations were made on native chestnut sprouts, large numbers of which grow naturally in the woods surrounding the plantations at Hamden, Conn. In almost every case the growth of the fungus was rapid in these native chestnuts.

The following will give some idea of the combinations used in crossing, where J = Japanese chestnut, A = American chestnut, and JA = Japanese-American hybrid. In each case the first parent is the female.

| *Parent Trees* | *Nuts Obtained* |
|---|---|
| J × JA | 255 |
| JA × JA | 162 |
| (JA × J) × (JA × J) | 72 |
| JA × J | 14 |
| (J × JA) × (JA × JA) | 11 |

From these and other crosses, 884 hybrid nuts were obtained in 1942.

*Cooperation.*—As in previous years, the cooperation of many individuals and institutions has been most gratifying and encouraging. The White Memorial Foundation, Inc., Litchfield, Conn., through Mr. Wm. Mitchell Van Winkle, president, and Mr. Clifford Ongley, superintendent, has taken over the raising and crossing, under our direction, of our Chinese-American hybrids and some of our pure Chinese seedlings, these having been transplanted April 25 from Hamden, Conn. to a good site near the East Morris–Litchfield road. Other hybrids, mostly of Chinese, Japanese, and Chinese chinquapin (*C. Seguinii*), were planted out on the estate of Mr. Archer M. Huntington at Redding Ridge, Conn., by the Connecticut Agricultural Experiment Station, through Dr. D. F. Jones, Geneticist at the Station; and on April 30 many combinations of the Chinese, Chinese chinquapin, S8, and the Japanese were transplanted by Mr. Holland R. Sperry to the grounds of the Avon Old Farms School, Avon, Conn. Dr. Jones also gave us the assistance of some of his men during the pollinating season and for a few days in addition; we are pleased to acknowledge this assistance here.

*Pests.*—We have been troubled more and more each year by the short-tailed pine mouse, which works underground, sometimes more than 6 inches deep, making use of mole runs where possible, and eating the roots of the chestnuts. We have lost many valuable hybrid seedlings on account of his depredations. Mr. F. B. Schuler, of the U. S. Department of the Interior, Fish and Wild

Life Service, located at the University of Connecticut, Storrs, Conn., visited our plantation at Hamden several times and gave us valuable advice and material for the control of this pest. In a later report we shall be able to devote more space to an account of this and other enemies.

Pollen of Japanese and Chinese chestnuts was received from Mr. Bowen S. Crandall of the Division of Forest Pathology, Forest School, Athens, Ga., on May 19; of the American chestnut from Mr. E. J. Grassmann of Elizabeth, N. J., on June 22 and 25; and of *Castanea alnifolia* from Mr. Joseph C. McDaniel, from Tallahassee, Fla., on July 5.

Nuts were received in the fall as follows:

September. American chestnut from Mr. Walter S. Funnell, Yonkers, N. Y.

October. American chestnut from Mr. Henry B. Mosle, Litchfield, Conn.; Mr. J. Francis Saunders, Hartford, Conn.; Mr. Clifford Ongley, Bantam, Conn.; Mr. L. Wolcott, Kennett Square, Pa.; Japanese chestnut through Mr. Harold E. Willmott, from farm of Dr. Brinkmann, Huntington, N. Y.; from Mr. Chas. J. Schlesinger, Monroe, N. Y.; through Mr. P. P. Pirone, New Jersey Agricultural Experiment Station, from Dover, N. J.; Chinese chestnut from Jennings Nurseries, Ralston, N. J.

November. American chestnut through Prof. Earl H. Newcomer, from Marion, N. C.; from Dr. Chas. C. Lieb of New York City, from Cornwall Hollow, Conn., through Mr. N. W. Hosley of Storrs, Conn.; from Miss Louise M. Norbery, Uxbridge, Mass.; chinquapin, and American chestnut-chinquapin hybrid (?) from Mr. Mifflin H. Wilde, Perry Point, Md.

*Acknowledgments.*—As in former years, we have enjoyed the cordial cooperation of the Division of Forest Pathology, U. S. Department of Agriculture, in this work. Among the visitors to the plantation during the past summer were several prominent botanists, foresters, and geneticists. It is a pleasure to have an opportunity here to acknowledge the helpful suggestions and encouragement of these and other visitors.

## FLOWER STRUCTURE AND THE CLASSIFICATION OF DICOTYLEDONS

BY ALFRED GUNDERSEN

Studies of flower structures were continued, with many drawings made by Miss Maud H. Purdy, including a detailed color study of the floral development in *Blumenbachia insignis.* Other possible relatives of Cactaceae have been studied, such as *Mesembryanthemum* and related genera. The linear colored parts of this group of genera are usually referred to as sterile stamens, sometimes as petals. The methods of attachment of the fertile and sterile stamens vary in an interesting manner in different species and show the common origin of these structures. In *Nymphaea* we have a series of transitions from stamens to petals often illustrated. The characters of *Mesembryanthemum* are very suggestive also of Cactaceae and Myrtaceae. In many Myrtaceae, for example *Leptospermum incanum*, the bases of the stamens are fused. Such fusion is not necessarily an advanced character, as it occurs in the fossil Cycadoidea. A change of Cactaceae to a more primitive position would involve many other families.

Other groups of which drawings have been made include Hamamelidaceae, Cornaceae, and Betulaceae; these families have many characters in common. A question in this connection is the number of ovules per flower. The ancestors of angiosperms were certainly wind-pollinated; with this goes usually numerous pollen grains and relatively few ovules. But few ovules or a single one is also often the condition of the flowers in which pollination by insects has been highly perfected. Similarly, basal placentation may be either a primitive and an advanced character, depending on the group.

A background for the Engler System of classification was Eichler's work on floral diagrams (1878). Eichler's diagrams, widely copied, are nearly all of cross sections of flowers. For the purpose of showing the attachment of parts, longitudinal sections are more suitable. Toward the end of the year a chart was prepared showing such sections of stamens and carpels in thirty-five families of dicotyledons with possible relationships indicated. The chart with accompanying text will be published soon.

The system of filing the many drawings in envelopes had become increasingly cumbersome. During the summer, Miss Clarke rearranged all drawings and put them into book form, or rather into a dozen loose-leaf books. With a new index of genera all are now readily accessible.

## HERBARIUM RESEARCH AND FIELD WORK

### BY HENRY K. SVENSON

Much of the time spent in research during the past year has been devoted toward preparation of a report on the relationship of the vegetation of the Galapagos Islands and that of the adjacent coast of South America. Opportunities for visiting this area were provided by the John Simon Guggenheim Memorial Foundation in 1941 and the detailed report will be accompanied by illustrations drawn by Miss Purdy. The United States National Herbarium and the Gray Herbarium of Harvard University have large collections from areas adjacent to those which I investigated, and their cooperation with me during visits and in the loan of herbarium material has been greatly appreciated. Part of the area in which I collected is now the site of the United States military base. It was most fortunate that this area could have been collected over botanically previous to the changes, which theoretically at least would involve the destruction of part of the vegetation and the influx of many species from the outside. Some of the plants which were obtained, such as *Zinnia peruviana*, have probably not been seen since the middle of the eighteenth century. The coast in the vicinity of Guayaquil, Ecuador, has been open to exploration for centuries. The early Spanish explorers came before 1800. Since that time plants have been collected by various nationalities, including such interesting expeditions as the French Voyage of the Bonite, during which Gaudichaud-Beaupré collected; the explorations of Humboldt and Bonpland (about 1800); explorations of the Voyage of the Sulphur (1836–1839), during which plants were extensively collected by Hinds and later described by Bentham; the 'round-the-world Voyage of the Swedish Frigate Eugenie (1852), during which Andersson made extensive collections on the island of Puna in the Gulf of Guayaquil and later touched at the Galapagos Islands. There have been scattered collections at later date. Very often new species have been described from this area without much attempt at correlation beyond a description by previous botanists.

During the spring a good deal of time was taken up in the preparation of a Guide to the Local Flora Section (Guide No. 14, July). This was illustrated by Miss Purdy from plants obtained in a living condition from this area, much attention being paid to the underground structures, the preservation of which is important in any transplantation.

During the year I have written an account of the Cyperaceae of part of the desert region of northern Mexico for the forthcoming report of Dr. I. M. Johnston, of the Arnold Arboretum, and also the Cyperaceae of Panama, in cooperation with the Missouri Botanical Garden.

## GENETICS

### *Variation in Nephrolepis*

### *Problems in the variation of certain native fern species*

By RALPH C. BENEDICT

War-year demands, with heavier teaching loads and with months of extra service in connection with emergency farm labor needs, have left no time for the active prosecution of research problems. The *Nephrolepis* collections have been maintained as well as possible within restricted space. Material from this collection was forwarded to Sister M. Angelita, of St. Mary of the Springs, Columbus, Ohio. The outdoor collection of hardy ferns has been maintained in thriving condition, with some accessions and exchanges with Fern Society members, for fern gardens, and for fern conservation aims.

## ECONOMIC PLANTS

By RALPH H. CHENEY

The subjects of investigation during 1942 have been as follows:

1. War-shortages of botanical drugs.

2. Availability of seeds and plants of medicinal value, with reference to New England and New York State Nurseries.
3. The sources and variety of herb teas obtainable in the eastern United States.
4. Histo-pharmacological effects of caffeine upon the heart tissue of the turtle. (Begun in 1941, continued in 1942.)
5. The effect of the purine complexes derived from plants upon the oxygen consumption of fertilized egg-cells.
6. The effect of the plant alkaloid, caffeine, upon the cleavage rate of marine eggs.

## REPORT OF THE CURATOR OF PUBLIC INSTRUCTION FOR 1942

To the Director:

I submit herewith the report of the work of the department for the year 1942.

### Attendance

*Grounds.*—The total attendance on the grounds was 1,660,046—somewhat less than in 1941 (1,753,381), but the drop is slight indeed if we take into account the gasoline shortage, the curtailment of railroad transportation, and the shortage of leisure, caused by war conditions.

*Classes and lectures.*—The combined attendance at classes for children and adults at the Garden was 59,544—smaller than the 1941 total, chiefly because of the ruling, made early in the year by the Board of Education, forbidding visits of school classes to public institutions. The subjoined table presents attendance figures month by month.

### Adult Courses

The total adult class registration for 1942 was 1,296, larger by 300 than that for 1941, and the largest of any year in the Garden's history except 1940. The largest registration was 246 persons in class A48, a free Victory Garden course, conducted by Mr. Free and Miss Dorward five Mondays in March and April. In the course entitled "Gardens within a Garden," consisting of weekly tours in the Garden to see the various floral features when in season, the registration in the spring was 135. This course was offered to members of the Department of Education of the Brooklyn Institute of Arts and Sciences, and the title and other details appeared on the weekly ticket of that Department.

In the fall a reciprocal arrangement was made with the Departments of Education and the Museums, of the Institute, whereby some of our courses were given without fee to members of those departments. A similar courtesy was granted to members of the Botanic Garden by these two Departments of the Institute. One of the courses thus offered, in harmony with the present widespread interest in culinary herbs, was entitled: "Herbs: their cultivation and uses," in which 89 persons registered. Since this was a rather unusual course, combining practical and cultural

ATTENDANCE AT THE GARDEN DURING 1942

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| At regular classes | 1,060 | 1,610 | 4,411 | 4,347 | 3,393 | 2,935 | 11,880 | 14,280 | 4,449 | 2,008 | 2,391 | 1,492 | 54,256 |
| At visiting classes | 45 | 76 | 92 | 280 | 524 | 66 | 112 | 0 | 0 | 2,071 | 755 | 1,267 | 5,288 |
| At lectures to children | 30 | 116 | 120 | 180 | 324 | 61 | 56 | 0 | 0 | 1,071 | 455 | 664 | 3,077 |
| At lectures to adults | 0 | 265 | 72 | 20 | 144 | 262 | 0 | 0 | 0 | 38 | 0 | 180 | 981 |
| At conservatories | 5,887 | 4,144* | 11,170 | 23,608 | 23,677 | 8,000 | 4,800† | 7,968 | 8,207 | 8,165 | 7,259 | 6,000‡ | 118,885 |
| At grounds | 70,476 | 72,498 | 106,107 | 279,216 | 282,643 | 153,298 | 151,517 | 136,075 | 138,180 | 140,109 | 77,604 | 52,323 | 1,660,046 |

* Greenhouse closed February 21–28.
† Closed July 17–29.
‡ Est. in part.

## STATISTICS OF SCHOOL SERVICE

| | 1941 | 1942 |
|---|---|---|
| Loan Lectures (Lantern Slides, etc.) | | |
| No. of sets lent | 14 | 26 |
| No. of teachers involved | 41 | 72 |
| No. of pupils attending | 2,825 | 3,084 |
| Material Supplied | | |
| Total number of requests from schools | 651 | 513 |
| Number of different institutions | 235 | 226 |
| High Schools and High School Annexes | | |
| Brooklyn (Total No. 38) | 23 | 16 |
| Queens (Total No. 27) | 10 | 7 |
| Manhattan (Total No. 53) | 9 | 5 |
| Other Boroughs (Total No. 32) | 10 | 4 |
| Junior High Schools (Total in Brooklyn 31) | 6 | 4 |
| Colleges and Universities (Total in Brooklyn 7) | 12 | 12 |
| Elementary Schools | | |
| Brooklyn (Total No. 227) | 85 | 125 |
| Queens (Total No. 147) | 11 | 8 |
| Manhattan (Total No. 126) | 8 | 9 |
| Other Boroughs (Total No. 150) | 16 | 12 |
| Private and Parochial Schools | 17 | 12 |
| Other Institutions | 28 | 12 |
| Number of potted plants for nature study | 1,736 | 2,371 |
| Number of Petri dishes filled with sterilized agar | 594 | 695 |
| Total number of teachers supplied with material | 6,781 | 5,518 |
| Total number of pupils reached | 304,003 | 256,586 |
| Living Plants Placed in School Rooms | | |
| No. of schools | 23 | 23 |
| No. of plants | 578 | 663 |
| No. of teachers involved | 942 | 451 |
| No. of pupils reached | 33,345 | 15,710 |
| Plants Distributed (Raised in Classes) | 44,567 | 38,309 |
| No. of persons taking plants | 1,880 | 1,216 |
| Total number of schools represented | 139 | 210 |
| Seed Packets for Children | | |
| No. of schools | 658 | 663 |
| No. of teachers | 8,792 | 16,380 |
| No. of pupils | 351,719 | 438,551 |
| No. of packets | 1,055,158 | 1,315,653 |
| Exhibits Provided | | |
| No. of exhibits | 4 | 9 |
| Viewed by | 123,100 | 119,665 |

instruction in a most attractive and unique manner, we are including here the entire schedule.

November 2. 11 a.m. Herbs for the small garden, and how to grow them. Elizabeth Remsen Van Brunt, Honorary Curator of Culinary Herbs.

November 9. 11 a.m. Use of herbs in cooking. Practical demonstrations. Mrs. H. K. Svenson, A.M., Instructor, Home Economics Department, New York University, and Miss Martha Louise Grant, of H. i. Williams Studio.

November 16. 11 a.m. Distillation from herbs. Actual processes shown. Mr. Clarke E. Davis, Vice President and Technical Director, Virginia Dare Extract Co., Inc.

November 23. 2:30 p.m.

1. Identification of herbs. Henry K. Svenson, Ph.D., Curator of the Herbarium.
2. Herb teas. Ralph H. Cheney, Sc.D., Resident Investigator (Economic Plants), and Professor of Biology, Long Island University. At the conclusion of this session herb teas were served.

## VICTORY GARDEN COURSES

After Pearl Harbor it became evident that the Botanic Garden could render valuable assistance in the ensuing national emergency. In February a *Leaflet* (Series XXIX, No. 1–2), prepared by this department, was issued, entitled "National Victory Garden Program of Brooklyn Botanic Garden." An open meeting was held in the Auditorium of the Garden on Feb. 19 at 3:30 p.m., at which special Victory Garden courses and regular Botanic Garden courses dealing with gardening were announced.

Because the Board of Education of New York City prohibited the visiting of museums and botanic gardens by classes from the High Schools, lists of talks to be given at the schools by members of the Garden staff were distributed to the teachers. The response was very gratifying. It should be added in this connection that a *Leaflet* entitled "The Victory Vegetable Garden" (Series XXIX, No. 5), by Mr. Montague Free, was issued on April 8. This contained advice and instruction for prospective vegetable growers. The total registration in these Victory Garden courses both in the spring and the fall of 1942 was 475.

*Adult courses given by members of this department.* Besides the "Gardens within a Garden" course already mentioned, two courses in medicinal plants were given for student nurses in Brooklyn Hospitals: one in the spring for a class of 44 from Brooklyn State Hospital, and one in the fall for a class of 38 from St. Johns Hospital. In the winter course "Trips to the Tropics," consisting of guided tours in the conservatories, 28 people were registered. For the courses on spring and fall wild flowers and ferns given by Miss Rusk there were 70 registrations.

## FLOWER DAYS

The following flower days were held in 1942. Considering the present world situation the attendance was good—about 125 for Cherry Blossom Day, 150 for Fifteenth Annual Rose Garden Day, and averaging about 50 for the three others. For the Fifteenth Annual Rose Garden Day the members of the Horticultural Society of New York were invited to attend, and about 100 members came.

1. *Cherry Blossom Day*, Tuesday, April 28, in charge of Dr. G. M. Reed. After a short talk at the Laboratory Building Dr. Reed led the group to the flowering cherries in the Oriental Garden and in and nearby "Cherry Walk."

2. *Iris Day,* Thursday, May 21, with Dr. G. M. Reed as lecturer and guide, was celebrated at a time when the Garden's splendid and comprehensive collection of bearded irises was at its best. Attendance, 30.

3. *Fifteenth Annual Rose Garden Day*, Tuesday, June 9. Mr. Montague Free spoke on "New Notions in Rose Growing." Following this was an inspection of the Rose Garden, under the guidance of Mr. Free and Mr. Tilley, foreman in charge of the Rose Garden.

4. *Fall Rose Garden Day*, Tuesday, October 8. After a short talk in the Laboratory Building Mr. Free conducted the group to the Rose Garden where he and Mr. Tilley drew attention to various conspicuous roses, explaining their parentage and their defects and virtues. Attendance, 60.

5. *Chrysanthemum Day,* Tuesday, October 27. Mr. Free gave a short talk in the Laboratory Building on chrysanthemums, illustrating his remarks with living specimens. Next the party adjourned to the chrysanthemum beds in the Garden for further discussion, with questions and answers. Attendance, 50.

Succeeding each one of these events tea was served in the Laboratory Building, the Woman's Auxiliary having charge of this part of the program, assisted by young ladies of the Garden staff.

## EXHIBITS OF THE WEEK AND MONTH

Eighteen "exhibit of the week" bulletins were set up on the grounds. Ten of these were new, as follows: Amur Adonis, Forsythia, Why not cut the grass?, Varnish Tree, East Indian Lotus, Water Lilies, Fleece Vine, Medlar, Firethorn (*Pyracantha*), and Bittersweet (*Celastrus orbiculatus*). As usual, these were all in charge of Miss Ashwell.

In December an "Exhibit of the Month" was installed in the conservatories, consisting of rubber-yielding plants. The most important ones, namely, *Hevea, Castilla, Ficus elastica, Guayule,* and *Cryptostegia,* were especially featured.

## PUBLICITY

Eighty pages of letter head size, containing news releases about the Garden, were mailed to the principal metropolitan newspapers, garden magazines, and other publications or institutions interested in Garden events. The results in publicity have been about as usual.

Circulars of spring and fall courses, radio programs, and the annual Prospectus of courses, were prepared. Postcard Bulletins were mimeographed and mailed to members of the Garden, as follows: (1) February 3, announcing the Victory Garden meeting in the Auditorium on February 19; (2) April 17, announcing display of magnolias and daffodils and beginning of spring courses in wild flowers; (3) April 21, announcing Cherry Blossom Day on April 28; (4) May 9, announcing the distribution to be made of 6,000 young herb and vegetable plants to members; (5) May 16, scheduling Iris Day for May 21; (6) May 27, acquainting members of the Fifteenth Annual Rose Garden Day on June 9; (7) September 23, telling of Fall Rose Garden Day on October 8; and (8) October 13, announcing Chrysanthemum Day on October 27. In addition, a mimeographed letter was sent on January 31 to 150 Garden Clubs announcing the Victory Garden meeting on February 19.

## PERSONNEL

Miss Rusk, besides her routine Botanic Garden work, has served as Librarian and Curator of the Herbarium of the American Fern Society. She has had the voluntary assistance of Mrs. Herbert Lawrence, a member of the Garden and one of her pupils, for 2 half days a week for 7 months in the year.

Miss Ashwell has prepared a new loan set of lantern slides on the subject of soil conservation, which, on account of lack of funds, is not yet ready for lending to the schools.

In January, I was elected to serve for another 3 year term on the Council of the Torrey Botanical Club, and I continued to serve as an associate editor of the *Bulletin* of the Club. I continued as editor of the Brooklyn Botanic Garden *Leaflets* and *Contributions,* and as editor of the plant section of *Biological Abstracts.* In January, I was elected a director of the School Nature League of New York City. I was appointed the delegate from the Brooklyn Botanic Garden to the celebration of the 75th anniversary of the founding of the Torrey Botanical Club. As a representative of the Garden, I attended two meetings of the Museums Council of New York City. I worked during the summer months at the chestnut plantation at Hamden, Conn., where we are carrying on breeding experiments with a view to obtaining a blight-resistant chestnut of timber type. During the year I continued to serve as Boy Scout Counselor in Forestry for Brooklyn.

## MISCELLANEOUS ITEMS

The answering of requests for information, in person, by letter, and by telephone has, as usual, occupied a considerable portion of the time of the members of this department.

On April 29, on a return trip from Connecticut, I brought the following living medicinal plants and gave them to Kings County Hospital for planting out on their grounds: *Sassafras variifolium, Myrica carolinensis, Mentha viridis, Podophyllum peltatum.*

Wood specimens of *Laurus nobilis*, the bay tree, *Rhus toxicodendron* (3½ inches in diameter and about 40 years old, from Mr. Arthur T. Caparn, Short Hills, N. J.), and *Ginkgo biloba*, were sent to Prof. Samuel J. Record, Dean of the Yale School of Forestry, to be added to the collection of woods there.

In response to a request, samples of poplar and birch logs were obtained through Dr. Gundersen on March 10 and given to the American Museum of Natural History, for a school exhibit of the Museum representing the interdependence of animals and plants. These logs had been cut by beavers to serve as material for their dams, and clearly showed the tooth marks.

The annual reunion of former students of this department was held on March 7 and was attended by about 60 people. As on similar occasions in the past, Mr. Rutherford Platt, of Platt Forbes Inc., again delighted the audience with some of his beautiful pictures of woods and fields in natural color, and also enlargements in color of winter buds, flowers and flower parts. Tea was served by members of this department.

Respectfully submitted,
ARTHUR HARMOUNT GRAVES,
*Curator of Public Instruction.*

## REPORT OF THE CURATOR OF ELEMENTARY INSTRUCTION FOR 1942

TO THE DIRECTOR:

I hereby present my report for the Department of Elementary Instruction for 1942.

The keynote to this report for the past year is the effect of the war on our work. It might seem as if botanical work would be set aside, but in fact, different phases have stood forth as of great importance to schools, general public, classes, and teachers.

In early January the Board of Education asked the Department of Elementary Instruction to give a short course (six weeks) on children's Victory Gardens. This was a compulsory course for teachers, one delegate being chosen from each school district of the City. At the close of the course the Borough of Queens asked for a similar one to be set up in its own Borough; and after that two more were requested—one by elementary teachers of Brooklyn and Manhattan, and one by local high school teachers. In all 144 teachers took these courses which extended from mid-January to mid-April. This helped compensate in numbers for teachers who dropped from our regular courses on account of short compulsory ones set up for war emergency work by the Board of Education.

Then, too, school classes were not permitted to make visits to outside institutions. So a poster was sent out to Brooklyn schools offering talks and demonstrations to be given at the schools for Grades 3–6 and for Junior High Schools. From March 2 until mid-June, every schoolday, two or more members of the Department were at local schools. Often but one talk for one class was requested, but it resulted in most cases that auditoriums were packed. It was impossible to continue the strain of long subway and bus trips, however, and to give so much time to one activity. So in the fall a poster was sent out stating that Mondays and Fridays would be our visiting days. The announcement had been out less than a week when our fall schedule was filled and enough requests left over a fill the spring of 1943. We covered in this work over 200 sessions, and reached over 28,000 children. The Board of Education in the meantime had raised its ban on school visits, but only a few schools took advantage of this. The private schools, Adelphi Academy, Berkeley Institute, Community School, and the Ethical Culture Schools of both Brooklyn and New York have continued their visits uninterrupted, but their groups are, as always, small.

The children's Saturday classes continued with no change in attendance because of war. Each child brought a note from home as an evidence of the parents' desire to have him attend classes. Arrangements were made for air raid protection and drills for the same were given in the summer.

Because of war measures the plan of summer teaching was changed, and Miss Carroll and Miss Hammond remained for July and August, setting aside their usual summer work.

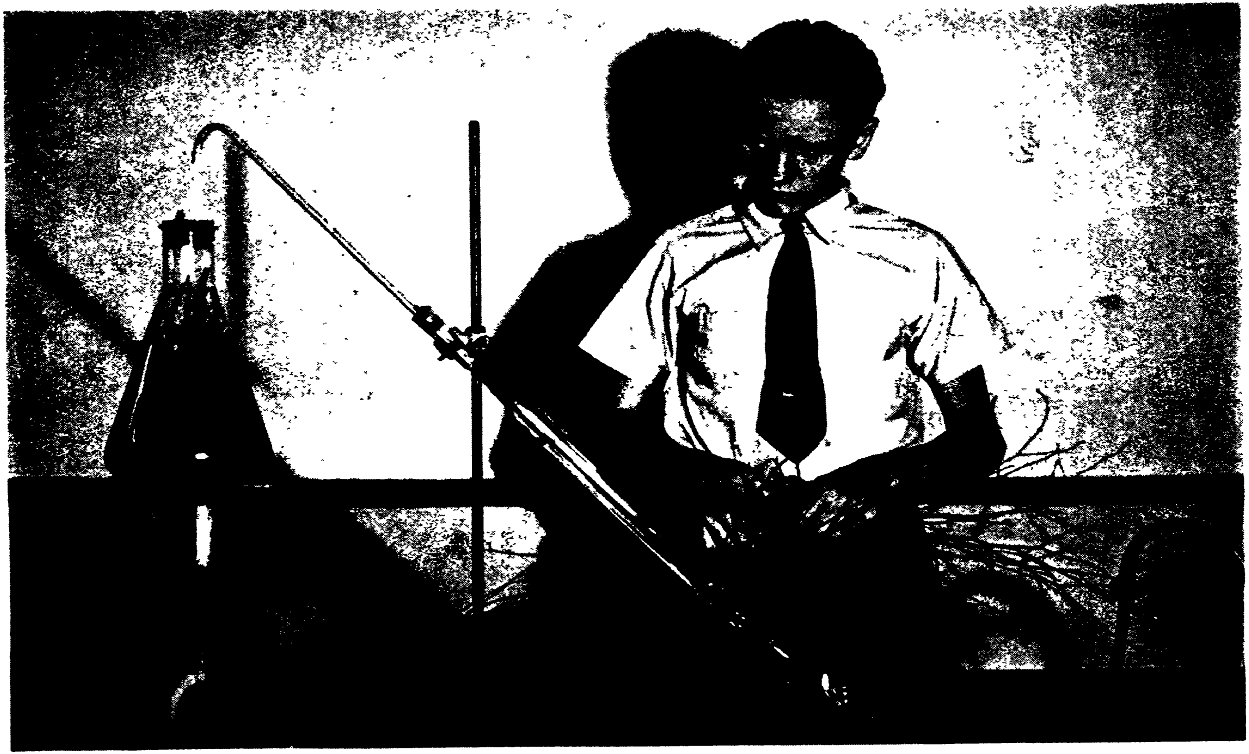

FIG. 4. Children study commercial products from plants. Here, distilling "wintergreen" oil from black birch twigs. Silver pin work. (10,448)

The children willingly gave up a portion of their garden area for a model Victory Garden, and by doubling up on what space remained, there was only a slight drop in numbers.

Figures often tell a story that is quick to grasp—

The Children's Garden produced a crop totaling in value $1,084.96. (Special honors go to tomatoes and beans.)

Study material was supplied to 174 institutions representing over 5,000 children.

Plants raised in our classes totaled over 38,000, and were raised by 1,200 students. Besides these, school gardens were supplied with 2,000 plants.

The number of Penny Packets of Seed distributed to children was 1,315,653. (Through 604 schools and institutions.)

Attendance at school classes visited was 28,536; the number of sessions, 202.

Attendance of adults in Garden classes was 50,960; registration, 632.

Seven exhibits were prepared and set up and viewed by over 10,000 people.

During the summer two interesting visits were made to see the educational work of our Children's Garden. Dr. Gerald Craig, Professor of Natural Sciences at Teachers College, brought his Summer Conference group over, and Dr. Jerome Metzner, of the Board of Education, came with his Committee on Museums and the Curriculum. These visits brought much pleasure to our children, who were greatly pleased by the enthusiasm of the grown people over their gardens.

The boys and girls made their third Christmas contribution to the Village of Northbourne, England. They also sent money to the Russian War Relief and to the United China Relief for children in those countries. During the war our boys and girls have raised through penny collections for the children of England, Russia, and China over $200.

We have published two more books in the series, started in 1941, on different phases of our work, "Children Come Visiting" and "The Children's Garden." These are a summary of over a quarter century of work here at the Brooklyn Botanic Garden.

The design for the cover, the color schemes, and general arrangements were made by Miss Carroll, of this department.

This might be a fitting time to sum up some of the extra work that has come to our Department this year.

Miss Dorward has been made responsible for the raising of plants for experimental purposes for the high schools. She planted and maintained the flower border of the Victory Garden. The supply of plants and flowers for the Brooklyn Naval Hospital was assumed by her. She taught some of the Victory Garden courses with Mr. Free, and assisted in others.

Miss Carroll not only has done her regular work in the Department, but in addition she arranged the cover for the Victory Garden Series announcement; designed and executed the Honorary Scroll given to Miss Mary Averill, Honorary Curator of Oriental Gardening and Floral Art; designed covers for the Victory Garden folder, the spring folder, the fall folder, and the Prospectus; made an exhibit sign for Dr. Reed's Department, a decorated enlargement of the Victory Garden drawn to scale, and a poster for the Natural History Exhibit at the Academy of Music, sponsored by the Department of Natural History of the Brooklyn Institute of Arts and Sciences.

The Curator arranged with the Brooklyn Edison Company to have a lesson in canning, at their auditorium, for members of our Victory Garden courses; another for the A25 and A26 classes, and in the summer, a special lesson for our older boys and girls. This was a group of forty who were very enthusiastic for the work and who later, as an outgrowth of this interest, visited certain of the markets to see the different types of vegetables not raised by themselves, but used in the city.

At the request of the Société Canadienne d'Histoire Naturelle, the Curator visited the Montreal Botanical Garden, November 27 to December 1. Since several visits were made here by their Curator of Education to see our work, it was a great pleasure and inspiration to visit them.

The following outside responsibilities have been carried on by members of the Department—

Miss Hammond—Vice President and presiding officer of the New York Chapter, American Nature Study Society.

Miss Miner—President of the Garden Education Department, National Education Association, and present Editor for the organization.

The Curator—Secretary of the National Plant, Flower & Fruit Guild; member, Board of Directors, American Nature Study Society; representative of the Brooklyn Botanic Garden at Board of Education meetings for closer contact between schools and outside institutions.

Respectfully submitted,

ELLEN EDDY SHAW,
*Curator of Elementary Instruction.*

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## REPORT OF THE CURATOR OF PLANTS FOR 1942

To the Director:

Herewith I present my report of activities during 1942.

### Herbaceous Plants

During midwinter, time was given as usual to the study and arrangement of herbarium specimens of our cultivated plants, of which we now have a good collection. We have completed brief keys to many of our herbaceous plants. These have a practical use for identifications, especially in spring, because so many plants are then in flower about the same time. We must know what we have in order to plan to discard some and try to obtain additional kinds. We can grow only a small part of the herbaceous plants of the world because of limited space and climatic conditions. For example, *Dianthus* is supposed to include about 250 species, and *Potentilla* about 200 species. We can select only a few desirable ones; to attempt to grow all would require an altogether disproportionate amount of time and space. Our constant aim, of course, is steadily to improve the quality of our collections.

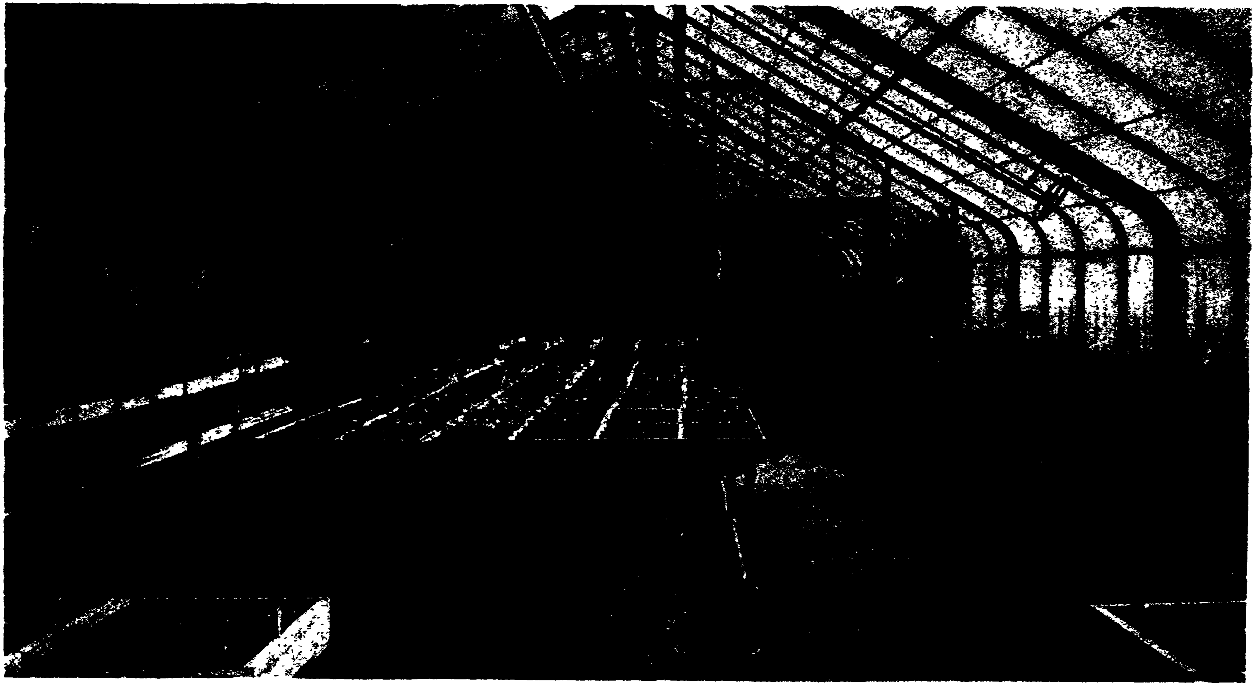

Fig. 5. Seedlings in flats for planting out in demonstration Victory Garden. March 14. (10,402)

In spring, with the aid of Miss Elizabeth Clarke, curatorial assistant, various improvements were made in the herbaceous plantings. The number of food plants and other useful plants was increased, and we hope to further increase this next season. Duplicates of *Dianthus* and *Gypsophila* were discarded, and the remainder separated, one bed for each genus. Similarly, *Potentilla* and *Geum* were separated, and the Labiatae and the Campanulaceae were rearranged.

To make the needed improvements in the herbaceous beds, part-time assistance of a gardener during spring and fall is much needed. In the nursery a slat or shaded area is much needed.

## TREES AND SHRUBS

Mr. Charles Doney, assistant in woody plants, reports on the planting of many trees and shrubs and on continued checking of labels and maps. Specimens were collected of additional trees, in particular of a number which have not yet flowered. In November, Mr. Doney visited the Arnold Arboretum for a number of days to study the collections there, and to collect seeds. Among species added, which we have not had previously on our grounds, are *Daphne Burkwoodii, Ilex macrocarpa* and *Magnolia cordata.*

## HALF-HARDY WOODY PLANTS

For several years we have been accumulating collections of half-hardy trees and shrubs south of the Rock Garden and especially in the protected north end of the nursery. These include a number of plants we have not been able to grow in more exposed situations in the Garden. Many people have been interested in these plants, which were listed in the Guides to Trees and to Shrubs recently published. It is probable that, by special attention to their requirements, several additional Southern species might be grown in these areas. It would be desirable to rearrange paths and plants there somewhat so as to be able to reach the plants more easily. Some protection from winter sun would be desirable. Rabbits, also, cause serious trouble, especially in the nursery.

## LILACS

In the spring I visited Swarthmore College, where Mr. John C. Wister is in charge of their interesting lilac collection. A number of our nursery lilacs were removed to the main collection. Shortage of labor prevented the removal of a number of large duplicate lilacs.

## CONSERVATORIES

In December a meeting of staff members was held to consider possible improvements in the conservatories, and many suggestions were received. As a result, the houses open to the public have been reduced in number but improved in quality, and more room has been made available for maintenance and propagation. In this connection extensive relabeling began near the end of the year.

## COURSES

In the spring, with Miss Clarke, I gave a course of ten lessons on Herbaceous Plants and five lessons on Lilacs. Mr. Doney gave his usual course on Ornamental Shrubs.

## STATISTICS RELATING TO LIVING PLANTS

| | *Species or Varieties* | *Plants* |
|---|---|---|
| *Living Plants Received:* | | |
| By collection | 26 | 309 |
| By exchange | 135 | 427 |
| By gift | 263 | 1,426 |
| By purchase | 202 | 541 |
| Total | 626 | 2,703 |

| | |
|---|---|
| *Plants and Cuttings Distributed:* | |
| To members, May 15 | 12,000 |
| To others | |
| By exchange | 1,291 |
| By gift | 3,940 |
| Total | 17,231 |

## SEED EXCHANGE

*Seed Packets Received:*

| | |
|---|---|
| By collection | 0 |
| By exchange | 110 |
| By gift | 106 |
| By purchase | 140 |
| Total | 356 |

*Seed Packets Distributed:*

| | |
|---|---|
| By exchange | 1,500 |
| By gift | 1,063 |
| Total | 2,563 |

## IRIS COLLECTIONS

### (In charge of Dr. George M. Reed)

*By Exchange:*

Mr. Robert Wayman, Bayside, L. I., N. Y.

| | |
|---|---|
| Bearded Iris | 7 varieties |
| Siberian Iris | 2 " |

Signs and labels were made by Mr. John McCallum, labeler, as follows:

## SIGNS AND LABELS

| | |
|---|---|
| Small galvanized labels for herbaceous beds and for Rose Garden fence | 110 |
| Large galvanized labels for herbaceous beds | 30 |
| Lead labels for woody plants | 107 |
| Wood labels for Roses, Iris, etc | 529 |
| Wooden signs | 31 |
| Cardboard signs | 311 |
| Wooden hanging labels for trees and shrubs | 245 |
| Total | 1,363 |

Also numerous miscellaneous numbers and signs.

Respectfully submitted,

ALFRED GUNDERSEN,
*Curator of Plants.*

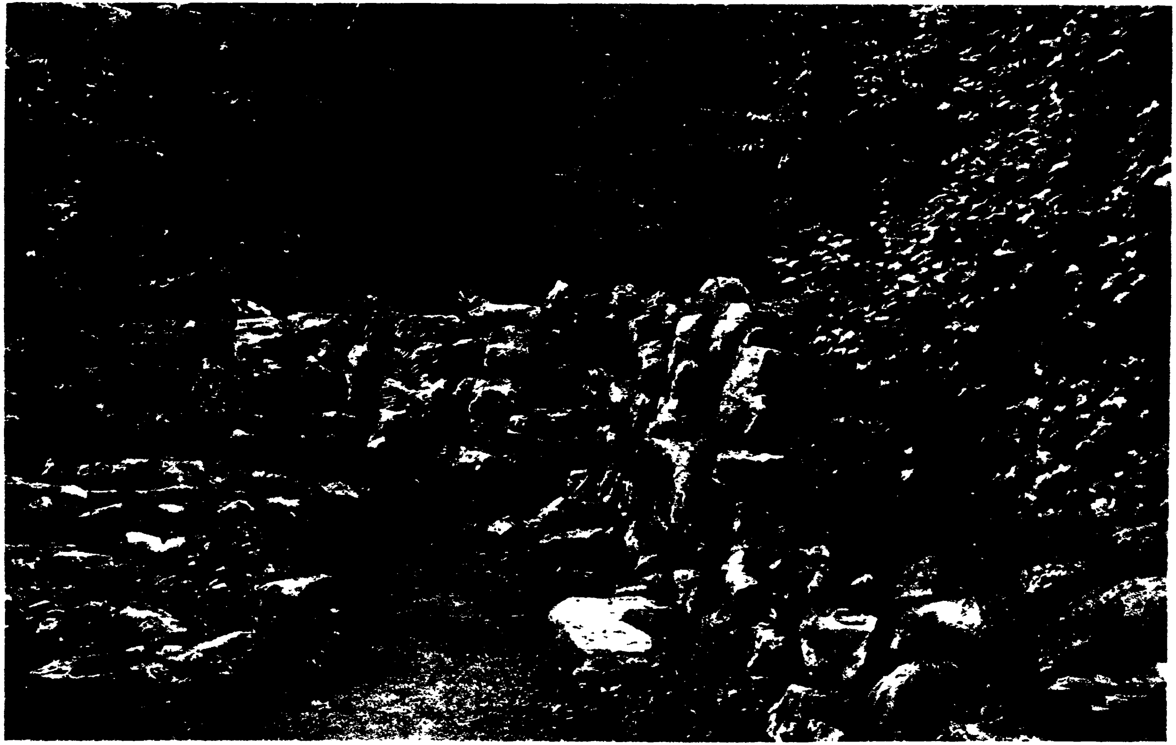

Fig. 6. Limestone ledge, newly constructed in Local Flora Section. First planting, April, 1942. (10,425)

# REPORT OF THE CURATOR OF THE HERBARIUM FOR 1942

TO THE DIRECTOR:

I submit herewith my report for the year ending December 31, 1942.

## THE LOCAL FLORA SECTION

I mentioned in my report for last year that we received through the kindness of Mr. Augustus Wittingham of Andover, New Jersey, sufficient limestone rock to construct a semicircular ledge some six feet in height at the southeast corner of the Section. The construction of this ledge was completed early enough for spring planting. The roughly finished construction is pictured in BROOKLYN BOTANIC GARDEN RECORD **31**: 203. July. Together with the broken-limestone area partially enclosed by this ledge, the area for successful growth of native plants has been greatly increased. We can now, I believe, have a good development of hepatica (*Hepatica acutiloba*), rue anemone (*Anemonella thalictroides*), blue cohosh (*Caulophyllum thalictroides*), and many other plants of limestone habitat which do not thrive unless conditions are good. The background of this area was a rather stiff clay soil and much work is still needed in order to make this and adjacent areas presentable.

It is hoped that during the coming year the bog can be largely replanted; cranberry vines (*Vaccinium macrocarpon*) have overrun a large part of the bog and have forced out many of the less resistant plants. It is planned to remove perhaps fifty per cent of the contents of the bog into an area lying between the bog and the limestone ledge, and to fill in the bog with fresh baled peat.

Much pruning and the removal of some old trees still needs to be carried out in the Local Flora Section, but such things can be done only gradually. Some of the dogwoods (*Cornus florida*) which were planted among the white pines (*Pinus Strobus*) on the border mound have become crowded and these dogwoods have been removed in the neighborhood of the upper gate. It is planned during the coming year to excavate an area about twenty feet across in the plantation of red maples (*Acer rubrum*) in order to provide a swamp-like pool for the growth and display of marsh marigold (*Caltha palustris*) and wild hellebore (*Veratrum viride*) in the spring. This would greatly enhance the appearance of the area.

In the early spring a truckload of turf containing a great deal of the bird-foot violet (*Viola pedata*) was obtained from the Hempstead Plains, on Long Island. This has been placed in an area to the right of the pathway as one enters the Section and provides some idea at least of the vegetation of this natural prairie which is fast disappearing on Long Island, due to the encroachment of dwellings and aviation fields.

The maintenance and building up of suitable soil in this area of two acres is a greater task than a single man can handle; the policy therefore of developing exhibits close to the main pathways and of leaving the rest of the area in a semi-wild condition has been fortunate. Since our present fences do not seem to offer a great deal of impediment to the entrance of boys, there has been a rather constant amount of vandalism in this area, which is somewhat remote from the other Sections of the Garden. During the Christmas season one of the best red spruces (*Picea rubra*) was cut down, presumably for a Christmas tree.

## HERBARIUM

The lack of transportation, and war activities have reduced the amount of material which has come into the herbarium by both collection and purchase. There is still a great deal of material to be mounted and the deficiency in material received can probably be counteracted in the opportunity for getting our material into a more useful state.

## HERBARIUM MATERIAL LOANED

| | *Sheets* |
|---|---|
| American Fern Society, Brooklyn, N. Y. | 5 |
| Bartram, Mr. E. B., Bushkill, Pike Co., Pennsylvania | 2 |
| Brown, Prof. V. E., Taylor University, Upland, Indiana | 32 |
| Constance, Dr. Lincoln, University of California, Berkeley, California | 4 |
| Core, Dr. E. L., West Virginia University, Morgantown, W. Va. | 1 |
| Deam, Mr. C. C., Bluffton, Indiana | 4 |
| Gray Herbarium, Cambridge, Mass. | 2 |
| Knable, Mr. J. P., II, Camp Marienfeld, Chesham, New Hampshire | 1 |

| | |
|---|---|
| Laurence, Dr. G. H. M., Cornell University, Ithaca, N. Y. | 56 |
| Underwood, Dr. J. K., University of Tennessee, Knoxville, Tenn. | 100 |
| U. S. Department of Agriculture, Washington, D. C. | 4 |
| U. S. National Herbarium, Washington, D. C. | 109 |
| | 320 |

## HERBARIUM MATERIAL BORROWED FOR STUDY

| | |
|---|---|
| Bartley, Mr. Floyd, Circleville, Ohio | 7 |
| Eyles, Mr. Don E., U. S. Public Health Service, Memphis, Tenn. | 4 |
| Fraser, Rev. Samuel V., Aurora, Kansas | 1 |
| Frick, Dr. T. A., Lincoln Memorial University, Harrogate, Tenn. | 14 |
| Goodwin, Dr. R. H., University of Rochester, Rochester, N. Y. | 133 |
| Gray Herbarium, Cambridge, Mass. | 137 |
| Kriebel, Mr. R. M., U. S. Department of Agriculture, Soil Conservation Service, Bedford, Indiana | 2 |
| Lepage, Rev. Ernest, Rimouski, Quebec, Canada | 60 |
| Lundell, Dr. C. L., University of Michigan, Ann. Arbor, Mich. | 31 |
| McFarland, Dr. F. T., University of Kentucky, Lexington, Ky. | 21 |
| Missouri Botanical Garden, St. Louis, Mo. | 4 |
| Murphy, Dr. R. C., American Museum of Natural History, New York, N. Y. | 14 |
| O'Neill, Rev. Hugh, The Catholic University of America, Washington, D. C. | 52 |
| Rollins, Dr. Reed C., Stanford University, Palo Alto, Calif. | 6 |
| Small, Dr. John A., New Jersey College for Women, New Brunswick, N. J. | 4 |
| U. S. Forest Service, Washington, D. C. | 3 |
| U. S. National Herbarium, Washington, D. C. | 113 |
| Williams, Prof. Elizabeth A., Converse College, Spartansburg, South Carolina | 36 |
| | 642 |

## HERBARIUM ACCESSIONS AND DISTRIBUTION

### *Phanerogamic Herbarium*

*Accessions:*

*By Gift:*

| | | |
|---|---|---|
| Ek, Mr. C. M., Kokomo, Indiana | 510 | |
| Fraser, Rev. S. V., Aurora, Kansas | 4 | |
| Hanmer, Mr. C. C., East Hartford, Conn. | 73 | |
| Harper, Dr. R. M., University, Alabama | 47 | |
| Lepage, Rev. E., Rimouski, Quebec, Canada | 35 | |
| Reynolds, Mr. H. C., University of Nebraska, Lincoln, Nebraska | 10 | |
| Waterfall, Mr. U. T., Oklahoma City, Oklahoma | 3 | 682 |

*By Exchange:*

| | | |
|---|---|---|
| Blake, Dr. S. T., University of Queensland, Brisbane, Australia | 106 | |
| Braun, Dr. E. Lucy, University of Cincinnati, Cincinnati, Ohio | 7 | |
| Clokey, Mr. Ira W., Clokey Herbarium, University of California, Berkeley, Calif. | 136 | |
| Constance, Dr. Lincoln, University of California, Berkeley, Calif. | 412 | |
| Core, Dr. E. L., West Virginia University, Morgantown, W. Va. | 6 | |
| Deam, Mr. C. C., Bluffton, Indiana | 33 | |
| Eyles, Mr. Don E., U. S. Public Health Service, Memphis, Tenn. | 7 | |
| Field Museum of Natural History, Chicago, Ill. | 9 | |
| Gray Herbarium, Cambridge, Mass. | 127 | |
| Howell, Mr. J. T., California Academy of Sciences, San Francisco, Calif. | 131 | |
| Kriebel, Mr. R. M., U. S. Department of Agriculture, Soil Conservation Service, Bedford, Indiana | 2 | |
| Lundell, Dr. C. L., University of Michigan, Ann Arbor, Mich. | 69 | |
| McFarland, Prof. F. T., University of Kentucky, Lexington, Ky. | 100 | |
| Missouri Botanical Garden, St. Louis, Missouri | 9 | |
| O'Neill, Rev. Hugh, The Catholic University of America, Washington, D. C. | 40 | |
| Tolstead, Dr. W. L., University of Nebraska, Lincoln, Neb. | 33 | |
| Tryon, Dr. R. M., Jr., Freelandville, Indiana | 100 | |
| U. S. Forest Service, Washington, D. C. | 2 | |
| U. S. National Herbarium, Washington, D. C. | 91 | 1,420 |

*By Collection:*

| | | |
|---|---|---|
| Ashwell, Miss G. Elizabeth, Brooklyn Botanic Garden | 6 | |
| Doney, Mr. C. F., Brooklyn Botanic Garden | 3 | |
| Graves, Dr. A. H., Brooklyn Botanic Garden | 4 | |
| Svenson, Dr. H. K., Brooklyn Botanic Garden | 376 | 389 |

*By Purchase:*

| | | |
|---|---|---|
| Landes, Hugh, Northcraft, R. D., Retherford, Miss Sylvia E., Stanford, L.R., University of Washington, Seattle, Washington | 407 | 407 |
| | | 2,898 |

*Distribution:*

*By Exchange:*

| | |
|---|---|
| Bazuin, Mr. C. W., Grand Rapids, Michigan | 20 |
| Braun, Dr. E. Lucy, University of Cincinnati, Cincinnati, Ohio | 35 |

| | | |
|---|---|---|
| Charette, Mr. L. A., Burlington, Vermont | 59 | |
| Clokey, Mr. I. W., Clokey Herbarium, University of California, Berkeley, Calif. | 197 | |
| Constance, Dr. Lincoln, University of California, Berkeley, Calif. | 2 | |
| Gilbert, Dr. F. A., Marshall College, Huntington, W. Va. | 86 | |
| Gray Herbarium, Cambridge, Mass. | 3 | |
| Howell, Mr. J. T., California Academy of Sciences, San Francisco, Calif. | 3 | |
| McFarland, Prof. F. T., University of Kentucky, Lexington, Ky. | 28 | |
| New York Botanical Garden, Bronx Park, New York | 1 | |
| New York State College of Agriculture, Ithaca, N. Y. | 301 | |
| Pennell, Dr. F. W., The Academy of Natural Sciences, Philadelphia, Pa. | 46 | |
| Purer, Miss E. A., Hoover High School, San Diego, Calif. | 25 | |
| Senn, Dr. H. A., Central Experimental Farm, Ottawa, Canada | 113 | |
| Tolstead, Dr. W. L., University of Nebraska, Lincoln, Nebraska | 26 | |
| Underwood, Dr. J. K., University of Tennessee, Knoxville, Tenn. | 2 | |
| U. S. National Herbarium, Washington, D. C. | 46 | 993 |
| *By Gift:* | | |
| O'Neill, Mr. Walter, West Englewood, New Jersey | 3 | 3 |
| | | 996 |

## *Cryptogamic Herbarium*

| | | |
|---|---|---|
| *Accessions:* | | |
| ***By Purchase:*** | | |
| Grout, Dr. A. J., Newfane, Vermont | 15 | 15 |
| *By Gift:* | | |
| Strickland, Mr. J. C., Jr., Petersburg, Virginia | 18 | 18 |
| | | 33 |

## *Mycological Herbarium*

| | | |
|---|---|---|
| *Accessions:* | | |
| ***By Exchange:*** | | |
| Bonar, Prof. Lee, University of California, Berkeley, Calif. | 185 | 185 |
| ***By Purchase:*** | | |
| Cooke, W. B., Mycobiota of Mount Shasta | 37 | 37 |
| ***By Collection:*** | 3,234 | 3,234 |
| | | 3,456 |

*Distribution:*

*By Exchange:*

| | | |
|---|---|---|
| Bonar, Prof. Lee, University of California, Berkeley, Calif. | 584 | |
| Seaver, Dr. Fred J., New York Botanical Garden, N. Y. | 600 | 1,184 |

Respectfully submitted,
HENRY K. SVENSON,
*Curator of the Herbarium.*

## REPORT OF THE HORTICULTURIST FOR 1942

TO THE DIRECTOR:

I submit herewith my report for the year ending December 31, 1942.

### PERSONNEL

In the course of the year we lost four men—Milton Gallub, inducted into the army; one man who left to operate a farm; and two men who left to engage in war industry.

#### *Student Observers*

Mr. Leonard Harrison and Mr. Norman Schweikert worked for a total of 364 hours.

#### *National Youth Administration*

| | |
|---|---|
| 1 youth | 450 hours |

Volunteering through the OCD, Mr. Adolf Muller worked for 84 hours.

### LOCAL FLORA SECTION

Six men worked for fourteen days in completing the limestone ledge started in 1941.

### ROSE GARDEN

Twenty-one new varieties of roses, 6 plants of each, were set out to replace discarded Hybrid Tea varieties. In addition, 6 new varieties of Floribunda roses, 6 of each; 14 standard or tree roses, and 5 new climbers were planted. One hundred and ten replacements were needed to fill out incomplete rows. For all these plants we are indebted to Bobbink & Atkins, Rutherford. N. J., 151; The Conard Pyle Company, West Grove, Pa., 85; Jackson & Perkins Company, Newark, N. Y., 55.

### MEDICINAL AND CULINARY HERB GARDEN

The "knots" were completely remade and a flagstone walk, 3 ft. × 32 ft. was laid.

### ESPLANADE

On the Esplanade and in the Rose Arc more than 30,000 square feet of lawn was dug over, grub-proofed by the addition of lead arsenate, and reseeded. The grade at the north end of the Esplanade was changed to eliminate the steep terrace bank and thus reduce cost of maintenance. At the south end of the Esplanade red, white, and blue petunias were planted in the form of a Victory "V," together with the symbol for Victory in the Morse code.

### MISCELLANEOUS

Owing to the crowded condition of the shrubs in the Horticultural Section many were removed and the remainder, to a large extent, replanted. On the Border Mound "weed" trees were removed to make room for interesting species which could not be accommodated in the Systematic Section.

The plantings of *Acanthopanax* on either side of the Richard Young entrance, outside the fence, were reset after improving the soil.

Nine hundred feet of chain-link fence was erected along Flatbush Avenue Border Mound, around the "White" Oak, and along the privet hedge bordering the Children's Garden.

In connection with air raid precautions 38 directive signs were made for the building, conservatories, and grounds.

### EXHIBITS

Our exhibit of graftage at the International Flower Show, in March, was awarded a gold medal. A Leaflet, "The Art of

FIG. 7. Serpentine Bank, Local Flora Section, showing *Euphorbia Darlingtonii* and *Cerastium arvense*. *Kalmia latifolia* in background. (10,427)

Graftage," Series XXIX, No. 3–4, March 18, 1942, was issued in connection with the exhibit.

A Victory Garden exhibit was installed in the Brooklyn Public Library (Ingersoll Memorial) and was on display April 9–20.

At the Victory Garden Harvest Show, in September, we exhibited cut sprays, in approximately 200 species and varieties, of fruits, crowded into 400 square feet. This exhibit was also awarded a gold medal.

## SEED AND PLANT DISTRIBUTION

The International Seed Exchange was temporarily discontinued, now for the third year, on account of the international situation.

*Living Plants Distributed.* About 12,000 herbs and vegetable plants were raised; 8,000 were distributed to members of the Botanic Garden, and the remainder were given to Victory Garden classes, institutions, and Botanic Garden employees; and used in the Demonstration Garden.

## VICTORY GARDEN

About 2,480 square feet were set aside in the Children's Garden for a Demonstration Victory Garden. This included a half-size model kitchen garden, and a collection of vegetables not included in the model garden. A flower border, surrounding three sides of the model garden, was planned, installed, and cared for by Miss Dorward. The garden was open to the public, with someone in attendance to answer questions and give out information, during certain afternoons and evenings for as long as the demand existed.

## COOPERATION WITH OTHER INSTITUTIONS

More than 340 shrubs were given to various army camps. Twenty-five packets of seed and upwards of 2,000 bedding plants were supplied for the embellishment of Camp Upton. We donated 18 shrubs to the Queens General Hospital, and more than 1,100 miscellaneous greenhouse and bedding plants to the Triboro Hospital.

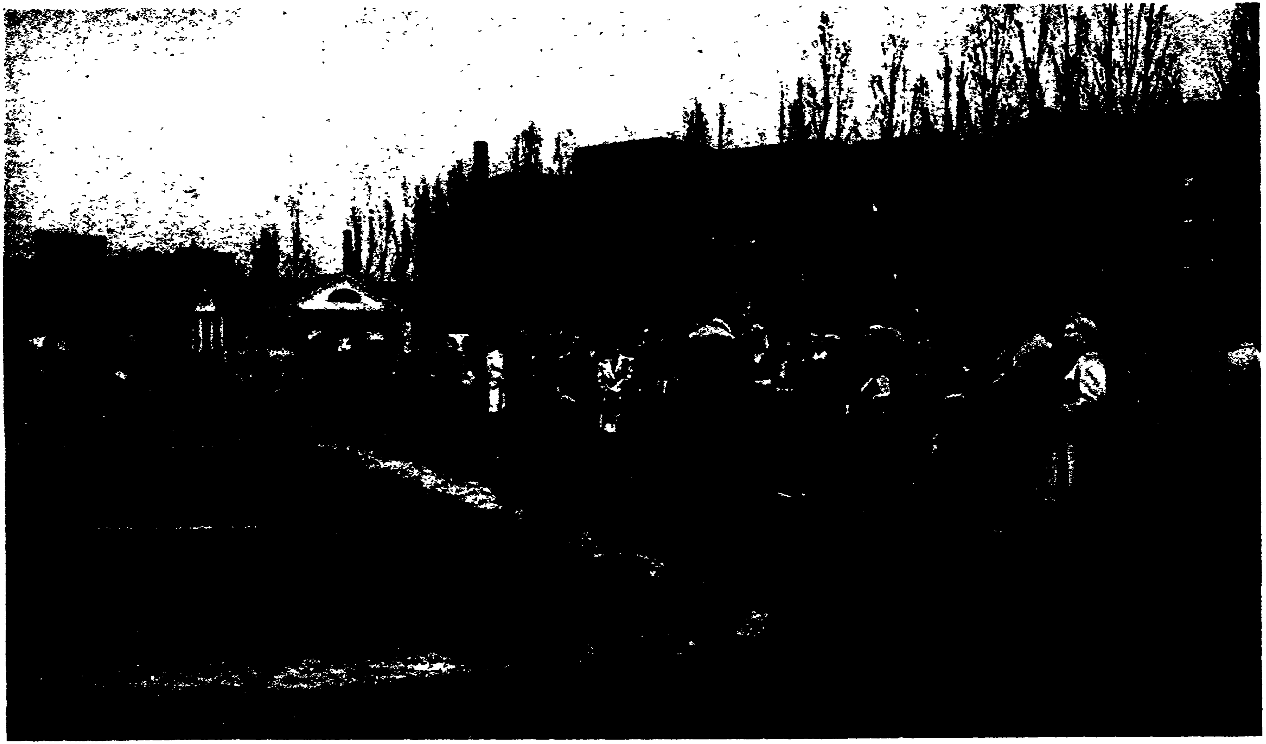

Fig. 8. Class in Victory Garden course. Laying out a vegetable garden. Mr. Free in charge. April. Cf. Fig. 9. (10412)

Fresh bamboo shoots were provided on two occasions to feed the pandas at the New York Zoo. In addition, we supplied 40 clumps of hardy bamboo for planting on their grounds. Mr. Bishop, foreman gardener, visited the Zoo and advised regarding the planting.

We supplied living plant material, dried lotus leaves and, through Dr. Reed, Kaoliang, rice, millet, and Chinese hull-less oats, to the Metropolitan Museum of Art to be used in an exhibit in their Junior Museum, illustrating Chinese life and art.

We gave the Garden Club of America some Douglas fir cones and soy beans for use in their exhibit of plant materials in war work.

Four hundred and fifty scions of flowering cherry and 50 of wisteria were given to the State Institute of Applied Agriculture at Farmingdale, Long Island.

## Personal Activities

I conducted the following courses of instruction for members and the general public at the Botanic Garden:

A47—The Kitchen Garden. Six lessons.

A48—Victory Garden Course. Five lectures and demonstrations. (With Miss Dorward.)

A49—Victory Greenhouse and Lecture Course. Five sessions. (With Miss Dorward.)

V1—Your garden this Fall. Five lectures.

"Information Please"—a single lecture.

All of the above were concerned with Victory Gardens.

I also gave one lecture in the course A37—Lilacs; and five in V4—Gardening Indoors.

I served on the Steering Committee of the Victory Garden Council of Western Long Island; and on the National, State, and City Victory Garden Harvest Show Committees. I attended Victory Garden Conferences of the North Eastern Region.

Respectfully submitted,

Montague Free,

*Horticulturist.*

Fig. 9. Model Victory Garden, July 2. Cf. Fig. 8. (10,522)

# REPORT ON THE LIBRARY FOR 1942

To the Director:

I submit herewith my report for the year ending December 31, 1942.

## Accessions

The collections at present comprise 44,184 pieces of which number 22,952 are volumes and 21,232 are pamphlets, an increase of 182 volumes and 701 pamphlets, or 883 pieces during 1942. Volumes purchased totaled 100. Gifts during the year were 60 volumes, 484 pamphlets, and 894 parts. The list of donors is included in Appendix I.

Of periodicals and other serials the library received 511 as exchanges, 78 as gifts, 112 as purchases, and 6 through publication, making a total of 707 titles—a falling off of 111 from 1941, reflecting the effect of the war on publication and international exchange.

### *List of some important accessions*

Coles, William. The Art of simpling . . . London, 1656.
Curtis, William. Flora Londinensis . . . London, 1777–98. 2 vols.
Hooker, William Jackson. Exotic flora . . . Edinburgh, 1823–27. 3 vols.
Macer, Aemilius, pseud. (i.e. Odo). De viribus herbarum . . . c. 1510.
Miller, Philip. Figures of the most beautiful, useful, and uncommon plants described in the Gardeners Dictionary . . . London, 1771. 2 vols.
Pallas, Peter Simon. Flora Rossica . . . Petropoli, 1784–88.
Stephens, Philip and Browne, William. Catalogus horti botanici Oxoniensis . . . Oxon., 1658.

## Library Work

During January and February the employees of the Brooklyn Botanic Garden cooperated in the donation of books for the use of members of the United States armed forces. A total of 229 books was turned over by the Library to the Victory Book Campaign. These made an interesting and impressive display on two tables in the rotunda.

For the seventy-fifth anniversary meeting of the Torrey Botanical Club at the Garden, on June 25th, the library had on display an autograph letter of John Torrey, the United States Mint Assay Medal for 1874, awarded to Torrey posthumously, and the letter presenting the medal to Miss Margaret Torrey, his daughter.

Reclassification of the books in the Children's Club Room Library was completed during the year.

### INTERLIBRARY LOANS

Books were loaned to: American Museum of Natural History, New York; Bishop McDonnell High School, Brooklyn; Brooklyn College; Brooklyn Museum; Brown University, Providence, R. I.; Carnegie Institution of Washington, Dept. of Genetics, Cold Spring Harbor, L. I.; Columbia University, New York; New Jersey Zinc Company, New York; New Rochelle Public Library; New York Botanical Garden; New York University, Washington Square Library; Rockefeller Institute for Medical Research, New York and Princeton, N. J.; Schwarz Laboratories, Inc., New York.

Books were borrowed from: The Medical Society of the County of Kings, Brooklyn; Pratt Institute, Brooklyn.

The statistical report follows.

Respectfully submitted,

WILLIAM E. JORDAN,
*Librarian.*

## STATISTICAL REPORT ON THE LIBRARY

### ACCESSIONS

| | *Autograph Letters* | *Portraits* | *Volumes* | *Pamphlets* | *Parts (Including Periodicals)* |
|---|---|---|---|---|---|
| Exchange | 0 | 0 | 22 | 114 | 3,133 |
| Gift | 3 | 9 | 60 | 484 | 894 |
| Publication | 0 | 0 | 0 | 102 | 53 |
| Purchase | 0 | 0 | 100 | 1 | 737 |
| By binding | 0 | 0 | 0 | 0 | 0 |
| Total | 3 | 9 | 182 | 701 | 4,817 |

| | |
|---|---|
| Total number of volumes in library, December 31, 1941 | 22,770 |
| Number of volumes added during 1942 | 182 |
| Total number of volumes in library, December 31, 1942 | 22,952 |
| Total number of pamphlets in library, December 31, 1941 | 20,531 |
| Number of pamphlets added during 1942 | 701 |
| Total number of pamphlets in library, December 31, 1942 | 21,232 |
| Total number of volumes and pamphlets in library, December 31, 1941 | 43,301 |
| Net increase of volumes and pamphlets during 1942 | 883 |
| Total number of volumes and pamphlets in library, December 31, 1942 | 44,184 |

## *American Fern Society Collection*

| | |
|---|---|
| Number of volumes, December 31, 1941 | 49 |
| Number of volumes added during 1942 | 2 |
| Total number of volumes, December 31, 1942 | 51 |
| Number of pamphlets, December 31, 1941 | 300 |
| Number of pamphlets added during 1942 | 18 |
| Total number of pamphlets, December 31, 1942 | 318 |
| Number of parts added during 1942 | 11 |

## *Serials and Periodicals*

(Including only those of which numbers were received in 1942)

| | |
|---|---|
| Subscription | 112 |
| Gift | 78 |
| Exchange | 511 |
| Publication | 6 |
| Total | 707 |

## CATALOGING

| | |
|---|---|
| Books, Pamphlets, and Serials catalogued | 1,242 |
| Total number of cards typewritten and filed | 1,896 |

## *Printed Cards*

| | |
|---|---|
| Torrey Botanical Club index cards on file, December 31, 1941 | 61,221 |
| Filed during 1942 | 1,352 |
| Total | 62,573 |

### MISCELLANEOUS

| | |
|---|---|
| Number of users of the Library | 3,699 |
| Books lent to members of the staff | 1,288 |
| Books lent to other institutions | 48 |
| Books borrowed from other institutions | 2 |

## REPORT OF THE RESIDENT INVESTIGATOR (FERNS) FOR 1942

TO THE DIRECTOR:

I submit herewith my report for the year ending December 31, 1942.

A report on the maintenance of the experimental material in *Nephrolepis* (Boston fern, etc.) and on a number of native species may be found on page 00.

For the American Fern Society, my work as a member of the editorial staff has been continued, involving correspondence, the preparation of articles, and the obtaining of articles. Despite the war situation, the *Fern Journal* and the American Fern Society have continued successfully. Field trips and meetings have had to be greatly circumscribed, owing to transportation restriction, but the other activities of the Society have remained as welcome relaxations. During 1943, the Society will definitely complete a full fifty years of existence. Started in 1892 with nineteen members, its roll now stands at just about four hundred members.

During 1942, the farm labor situation has called for the enlistment of emergency workers from many new sources, especially from the ranks of city students. In connection with Brooklyn College work, I was involved in a program of recruiting for such service, and finally for part of the supervision of three labor camps, consisting mostly of Brooklyn College students. With that as an experiment, we have carried on active planning during the fall for an expanded program for the summer of 1943. In this planning, I have been greatly aided by the cooperation of members of the Botanic Garden staff; especially by Drs. Reed and Utter, and by Miss Shaw and Mr. Jordan, as well as by Botanic Garden facilities in general. This is another illustration of the capacity and readiness of the Botanic Garden to contribute most fruitfully to the educational work of the borough.

Respectfully submitted,
RALPH C. BENEDICT,
*Resident Investigator (Ferns).*

## REPORT OF THE RESIDENT INVESTIGATOR (ECONOMIC PLANTS) FOR 1942

TO THE DIRECTOR:

I herewith submit a report of the activities of the Resident Investigator for Economic Plants for the year 1942. With the consent of the Garden, the Brooklyn Botanic Garden—Long Island University Course dealing with Economic Botany was omitted during the academic year 1941–1942. The resident investigator served as guide for several student-groups from the College of Arts and Sciences and also from the College of Pharmacy of Long Island University to the Botanic Garden Conservatories and Grounds for general taxonomic studies. The herb and medicinal section was of special interest.

The summer of 1942 was spent in research at the Marine Biological Laboratory at Woods Hole, Massachusetts. Laboratory investigations dealt with the effect of the purine complexes derived from plants upon the problem of cell permeability and the oxygen consumption of fertilized animal egg-cells. Field work was conducted to determine the availability in the nurseries and in the eastern Massachusetts area of drug and beverage (herb teas) plants in view of the current war shortages. A considerable variety of plants were found to be available for beverage substitutes, but no appreciable source of drug plants was located in New England.

Reports on research, lectures, radio talks, and publications are given elsewhere in this annual report under their respective captions.

Respectfully submitted,
RALPH H. CHENEY,
*Resident Investigator (Economic Plants).*

# FINANCIAL STATEMENT FOR 1942

## I *a*. TAX BUDGET JANUARY 1, 1942–JUNE 30, 1942

| *Accounts* | *Balances, December 31, 1941, of appropriations for period 7/1/41–6/30/42* | | *Expenditures 1/1/42–6/30/42* | | *Balance June 30, 1942* | |
|---|---|---|---|---|---|---|
| *Personal Service* | | | | | | |
| Salaries—Regular Employees | $29,606.34 | | $29,606.34 | | $0.00 | |
| Wages—Temporary Employees | 9,040.90 | | 9,040.90 | | 0.00 | |
| Total Personal Service | | $38,647.24 | | $38,647.24 | | $ 0.00 |
| *Other than Personal Service* | | | | | | |
| Supplies, Equipment, Materials, Repairs and Services | | 9,744.41[1,2] | | 9,577.94 | | 166.47 |
| Totals | | $48,391.65 | | $48,225.18 | | $166.47 |

## I *b*. TAX BUDGET JULY 1, 1942–DECEMBER 31, 1942

| | *Appropriations for period 7/1/42–6/30/43* | | *Expenditures 7/1/42–12/31/42* | | *Balance December 31, 1942* | |
|---|---|---|---|---|---|---|
| *Personal Service* | | | | | | |
| Salaries—Regular Employees | $62,005.00 | | $30,652.50 | | $31,352.50 | |
| Wages—Temporary Employees | 21,200.00 | | 10,130.50 | | 11,069.50 | |
| Total Personal Service | | $83,205.00 | | $40,783.00 | | $42,422.00 |
| *Other than Personal Service* | | | | | | |
| Supplies, Equipment, Materials, Repairs and Services | | 8,365.00 | | 2,656.02 | | 5,708.98 |
| Totals | | $91,570.00 | | $43,439.02 | | $48,130.98 |

[1] Includes $435.00 transferred from Codes 5442–109 "Fuel Supplies" and 5442–331 "Agricultural and Botanical Equipment" to Codes 5442–102 "Printed Stationery and Forms," 5442–105 "Motor Vehicle Supplies" and 5442–131 "Agricultural and Botanical Supplies" in accordance with Board of Estimate resolution dated June 25, 1942.

[2] Includes $1000.00 transferred from New York City Code 9901–009 "Fund for Salary and Wage Accrual" to Code 5442–408 "Repairs to Buildings and Structures" in accordance with Board of Estimate resolution dated August 5, 1942.

## II. Private Funds Accounts

| *Permanent Funds* (*Restricted*[1]) | *Principal* | *Balance January 1, 1942* | *Income* | *Expenditures* | *Balance December 31, 1942* |
|---|---|---|---|---|---|
| 1. Endowment Fund | $ 55,220.17 | $ 0.00 | $ 1,932.68 | $ 1,932.68 | $ 0.00 |
| 2. Life Membership | 11,068.08 | 0.00 | 387.40 | 387.40 | 0.00 |
| 3. George C. Brackett | 560.89 | —3.36 | 19.60 | 5.25 | 10.99 |
| 4. Cary Library Fund | 2,248.71 | 57.27 | 78.68 | 123.58 | 12.37 |
| 5. Benjamin Stuart Gager | 15,180.91 | 291.38 | 531.32 | 533.34 | 289.36 |
| 6. Martha Woodward Stutzer | 10,913.34 | 26.91 | 385.11 | 408.92 | 3.10 |
| 7. Mary Bates Spalding | 2,974.64 | 139.29 | 104.08 | 160.72 | 82.65 |
| 8. Alfred T. White | 272,304.99 | 0.00 | 9,530.64 | 9,530.64 | 0.00 |
| 9. A. Augustus Healy Bequest | 10,809.60 | 0.00 | 378.32 | 378.32 | 0.00 |
| 10. Robert B. Woodward Fund | 27,030.73 | 0.00 | 946.04 | 946.04 | 0.00 |
| 11. Endowment Increment Fund | 62,477.11 | 0.00 | 2,156.96 | 2,156.96 | 0.00 |
| 12. A. T. White Memorial Tablet | 4,248.33 | 0.00 | 148.64 | 148.64 | 0.00 |
| 13. Brooklyn Institute Centennial | 32,336.03 | 0.00 | 1,131.76 | 1,131.76 | 0.00 |
| 14. John D. Rockefeller, Jr. | 265,062.22 | 0.00 | 9,277.18 | 9,277.18 | 0.00 |
| 15. Citizens Endowment | 269,191.38 | 0.00 | 9,421.70 | 9,421.70 | 0.00 |
| 16. Henry W. Healy Trust | 54,608.53 | 117.60 | 1,834.22 | 1,780.02 | 171.80 |
| 17. Mrs. H. C. Folger Fund | 1,005.29 | 29.66 | 35.20 | 35.00 | 29.86 |
| 18. John W. Frothingham | 10,000.00 | 0.00 | 350.00 | 350.00 | 0.00 |
| 19. F. E. W. Fund | 250,000.00 | 0.00 | 8,750.00 | 8,750.00 | 0.00 |
| 20. Ellen Eddy Shaw Endowment | 24,373.67 | 782.39 | 851.95 | 670.76 | 963.58 |
| 21. Herbarium Endowment | 4,000.00 | 127.93 | 140.00 | 203.67 | 64.26 |
| 22. Public Instruction Endowment | 2,234.93 | 58.65 | 78.20 | 4.00 | 132.85 |
| Totals | $1,387,849.55 | $ 1,627.72 | $ 48,469.68 | $ 48,336.58 | $ 1,760.82 |
| *Special Accounts* (*Restricted*) | | | | | |
| 23. Ella Reussner Trust: Income Account | | $ 398.99 | $ 2,087.49 | $ 2,037.36 | $ 449.12 |
| 24. Sustaining Membership | | 633.08 | 1,424.43 | 1,447.75 | 609.76 |
| 25. Annual Membership | | 748.59 | 3,533.78 | 4,006.38 | 275.99 |
| 26. Tuition and Sales | | 1,015.82 | 14,378.60 | 13,767.09 | 1,627.33 |
| 27. Collections Fund | | 388.56 | 3,584.69 | 3,712.54 | 260.71 |
| 28. Special Purposes | | 3,565.40 | 4,996.66 | 3,615.47 | 4,946.59 |
| 29. Plant Pathology Research | | 0.00 | 6,500.00 | 6,500.00 | 0.00 |
| 30. Special Contributions | | 2,984.92 | 64,829.14 | 65,001.19 | 2,812.87 |
| Totals | | $ 9,735.36 | $101,334.79 | $100,087.78 | $10,982.37 |
| Gross Total | $1,387,849.55 | $11,363.08 | $149,804.47 | $148,424.36 | $12,743.19 |
| Deduct inter-account transactions | | | 67,068.46 | 67,068.46 | |
| Grand Totals | $1,387,849.55 | $11,363.08 | $ 82,736.01 | $ 81,355.90 | $12,743.19 |

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[1] To the educational and scientific work of the Garden.

### III. SUMMARY OF TOTAL MAINTENANCE BUDGET FOR CALENDAR YEAR 1942

| | *Income* | | | *Expenditures* | | | |
|---|---|---|---|---|---|---|---|
| | *Personal Service* | *Other than Personal Service* | *Total* | *Personal Service* | *Other than Personal Service* | *Total* | *Balance* |
| Balance at Dec. 31, 1941 Tax Budget Appropriations 7/1/41–6/30/42 | $ 38,647.24 | $ 9,744.41[1, 2] | $ 48,391.65 | $ 38,647.24 | $ 9,577.94 | $ 48,225.18 | $ 166.47[3] |
| Tax Budget Appropriation 7/1/42–6/30/43 | 83,205.00 | 8,365.00 | 91,570.00 | 40,783.00 | 2,656.02 | 43,439.02 | 48,130.98 |
| Total | $121,852.24 | $18,109.41 | $139,961.65 | $ 79,430.24 | $12,233.96 | $ 91,664.20 | $48,297.45 |
| Less Balance at 12/31/42 of Tax Budget Appropriation for 7/1/42–6/30/43 | 42,422.00 | 5,708.98 | 48,130.98 | | | | 48,130.98 |
| Tax Budget (49.39%) | 79,430.24 | 12,400.43 | 91,830.67 | 79,430.24 | 12,233.96 | 91,664.20 | 166.47[3] |
| Private Funds (50.61%) | 67,814.06 | 26,285.03 | 94,099.09 | 65,001.19 | 16,354.71 | 81,355.90 | 12,743.19 |
| Totals | $147,244.30 | $38,685.46 | $185,929.76 | $144,431.43 | $28,588.67 | $173,020.10 | $12,909.66[3] |

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[1] Includes $435.00 transferred from Codes 5442–109 "Fuel Supplies" and 5442–331 "Agricultural and Botanical Equipment" to Codes 5442–102 "Printed Stationery and Forms," 5442–105 "Motor Vehicle Supplies" and 5442–131 "Agricultural and Botanical Supplies" in accordance with Board of Estimate resolution dated June 25, 1942.

[2] Includes $1000.00 transferred from New York City Code 9901–009 "Fund for Salary and Wage Accrual" to Code 5442–408 "Repairs to Buildings and Structures" in accordance with Board of Estimate resolution dated August 5, 1942.

[3] Balance of $166.47 remaining from City Appropriation for 1941–1942 reverted to City of New York—General Accrual Fund.

Respectfully submitted,
EDNA A. PALMITIER,
*Acting Secretary.*

*Note:* The above "Financial Statement" is a transcript of Brooklyn Botanic Garden Accounts in the books of the Treasurer of the Brooklyn Institute of Arts and Sciences. The Treasurer's accounts are audited annually by a Public Accountant, and a separate audit of this "Financial Statement" is not made in order to save unnecessary expense.

EDWIN P. MAYNARD,
*Treasurer.*

# APPENDIX I

## GIFTS RECEIVED DURING 1942

### Collections Fund *

Dr. J. D. Allen
Mrs. Frank L. Babbott
Battle Pass Chapter—D.A.R.
Mr. Philip Benson
Mrs. Philip A. Benson
Miss Dorothy L. Betts
Allen D. Brush
Mrs. Glentworth R. Butler
Mrs. S. Parkes Cadman
Mr. and Mrs. Franklin Chace
Mrs. William H. Childs
Mrs. Walter V. Cranford
Walter H. Crittenden
Otto Ebel
Mrs. Remick C. Eckardt
Mrs. William W. Emerson
Hon. Lewis L. Fawcett
Mrs. Lewis W. Frances
Mrs. J. Morton Halstead
Anonymous
Anonymous
Mrs. Raymond V. Ingersoll
William L. James
George W. Koerner
Dr. Laura A. Kolk
Miss Maria Knox
William Lementry
Miss Hilda Loines
Mrs. George Lyons
Mrs. Edwin P. Maynard
Edwin P. Maynard
Joseph McGuiness
Miss Marion S. Morse
North Country Garden Club
Mrs. Dean C. Osborne
Mrs. Charles E. Perkins
Mrs. John W. Perry
Mrs. W. Sterling Peters
Mrs. James H. Post
Mrs. Frederic B. Pratt
Mrs. Benjamin Prince
Mrs. John J. Sheridan
Mrs. Frank E. Simmons
Dr. Bernard H. Smith
Mrs. B. Herbert Smith
Miss Elise W. Stutzer
Mr. and Mrs. J. R. Van Brunt
"C. W."
Mrs. Walter F. Wells
Miss Harriet H. White
Richmond B. Williams
Women of '76 Chapter N.S.D.A.R.

Total amount contributed .................................. $3,471.00

### Flower Show Exhibit

International Exposition Company (Special Award, Flower Show Exhibit) .................................. $ 500.00

### Plant Pathology Research Fund

| | |
|---|---|
| Anonymous | $1,500.00 |
| Anonymous | $2,500.00 |

* *Note.*—Contributions to the Brooklyn Botanic Garden constitute proper deductions under the Federal and New York State Income Tax Laws.

## Ellen Eddy Shaw Endowment Fund

| | | |
|---|---|---|
| Dr. and Mrs. I. C. Becher | $ 5.00 | |
| Max Beckerman | 2.00 | |
| George H. Greenwood | 5.00 | |
| Mrs. Muriel A. Davey | 5.00 | |
| New Canaan Garden Club | 20.00 | |
| Public School 89 | 5.00 | |
| Mrs. Arthur Smalley | 3.00 | |
| Melvin Small | 5.00 | $ 50.00 |

## Special Gifts for Children's Work

| | | |
|---|---|---|
| Mrs. Glentworth Butler | $ 9.00 | |
| Dr. C. Stuart Gager | 6.16 | |
| Garden Teachers Association | 9.79 | |
| Mrs. Charles Perkins | 25.00 | |
| Memorial Fund for Mary E. Quinn | 303.09 | $353.04 |

## Special Needs of Garden

| | | |
|---|---|---|
| Anonymous | $ 38.50 | |
| Anonymous | 500.00 | $538.50 |

## Special Purposes Designated by Donors

| | | |
|---|---|---|
| Anonymous | $500.00 | |
| Mrs. Theodore Hetzler | 7.00 | |
| Anonymous | 100.00 | |
| Anonymous | 250.00 | $857.00 |

## Library

### Books

| | |
|---|---|
| Anonymous | 2 |
| Association Canadienne-Française pour l'Avancement des Sciences, Montreal, P. Q. | 1 |
| Bates, Mr. Alfred, Newark, N. J. | 1 |
| Brandwein, Dr. Paul F., New York, N. Y. | 2 |
| Caton, Mr. J. L., Knoxville, Tenn. | 1 |
| Cork Institute of America, New York, N. Y. | 1 |
| Fondo de Cultura Economica, Mexico, D. F. | 1 |
| Gager, Dr. C. Stuart, Brooklyn, N. Y. | 21 |

| | |
|---|---|
| Gager, Mrs. C. Stuart, Brooklyn, N. Y. | 1 |
| Hatheway, Mrs. Philip M., Brooklyn, N. Y. | 1 |
| Heffernan, Hon. James J., Washington, D. C. | 2 |
| Hyde, Mrs. Alice Earle, Waterbury, Conn. | 1 |
| Imperial Institute, Plant and Animal Products Department, London, England | 1 |
| Jaques, Mr. H. E., Mt. Pleasant, Iowa | 1 |
| Loines, Miss Hilda, Brooklyn, N. Y. | 1 |
| Pocket Books, Inc., New York, N. Y. | 1 |
| Reed, Dr. George M., Brooklyn, N. Y. | 2 |
| Roberts, Mrs. John S., Brooklyn, N. Y. | 1 |
| Rockefeller Foundation, New York, N. Y. | 1 |
| Selverstone, Miss Betty Jane, Brooklyn, N. Y. | 1 |
| Selverstone, Miss Braunda Hoda, Brooklyn, N. Y. | 1 |
| Svenson, Dr. Henry K., Brooklyn, N. Y. | 1 |
| Tea and Coffee Trade Journal, New York, N. Y. | 3 |
| Van Rensselaer, Mr. Maunsell, Santa Barbara, Cal. | 1 |
| Wilde, Dr. Sergey Alexander, Madison, Wisc. | 1 |
| Total | 51 |

## PAMPHLETS

| | |
|---|---|
| Acosta Solis, Dr. M., Quito, Ecuador | 1 |
| Albaum, Dr. Harry G., Brooklyn, N. Y. | 2 |
| American Association of Botanical Gardens & Arboretums, Committee on Horticultural Varieties, Swarthmore, Pa. | 1 |
| American Fern Society | 1 |
| American Nurseryman, Chicago, Ill. | 2 |
| American Potash Institute, Washington, D. C. | 5 |
| Asenjo, Dr. Conrado F., San Juan, P. R. | 10 |
| Bailey, Mr. C. H., St. Paul, Minn. | 1 |
| Benedict, Dr. Ralph Curtiss, Brooklyn, N. Y. | 1 |
| Brooks, Mr. Marvin M., New York, N. Y. | 1 |
| Buswell, Mr. Walter M., Miami, Fla. | 1 |
| Caius, Rev. J. F., Bombay, India | 1 |
| Charles, Miss Vera K., Washington, D. C. | 1 |
| Cheney, Dr. Ralph Holt, Brooklyn, N. Y. | 1 |
| Chief Conservator of Forests, Accra, Gold Coast Colony | 1 |
| Chitwood, Dr. B. G., Babylon, L. I. | 2 |
| Clos, Dr. Enrique C., La Plata, Argentina | 2 |
| Conard, Dr. Henry S., Grinnell, Iowa | 1 |
| Conn, Dr. H. J., Geneva, N. Y. | 1 |
| Crovetto, Sr. R. M., Buenos Aires, Argentina | 1 |
| Duman, Rev. Maximilian G., Washington, D. C. | 1 |
| DuPont de Nemours Co., Inc., Wilmington, Del. | 1 |

| | |
|---|---|
| Eastwood, Miss Alice, San Francisco, Cal. | 2 |
| Egler, Prof. Frank E., Syracuse, N. Y. | 1 |
| Emery, Mr. Clark, Bloomington, Ind. | 1 |
| Fritzsche Bros., Inc., New York, N. Y. | 56 |
| Gager, Dr. C. Stuart, Brooklyn, N. Y. | 91 |
| Godshall, Capt. A. B., Panama Canal Zone | 1 |
| Goldman, Dr. Frederick H., Bethesda, Md. | 2 |
| Graves, Dr. Arthur Harmount, Brooklyn, N. Y. | 6 |
| Greenfield, Mr. Sydney S., New York, N. Y. | 3 |
| Gundersen, Dr. Alfred, Brooklyn, N. Y. | 154 |
| Haggis, Dr. A. W., London, England | 1 |
| Heffernan, Hon. James J., Washington, D. C. | 2 |
| Henrici, Prof. Arthur T., Minneapolis, Minn. | 1 |
| Herb Society of America, New York Unit, Bedford, N. Y. | 1 |
| Hessler, Dr. L. R., Knoxville, Tenn. | 7 |
| Hester, Mr. J. Pinckney, Boulder City, Nev. | 3 |
| Hyde, Mrs. Alice Earle, Waterbury, Conn. | 3 |
| Jenkins, Dr. Anna E., Washington, D. C. | 4 |
| Kolachov, Dr. Paul J. Louisville, Ky. | 1 |
| Lankenau Hospital, Research Inst., Philadelphia, Pa. | 1 |
| Lee, Mr. John R., Glasgow, Scotland | 1 |
| Lewis, Dr. Frederic T., Boston, Mass. | 1 |
| Long Island Association, New York, N. Y. | 1 |
| Magnus, Mabee and Reynard, Inc., New York, N. Y. | 1 |
| Massachusetts Horticultural Society, Boston, Mass. | 2 |
| National Cottonseed Products Association, Inc., Memphis, Tenn. | 1 |
| National Farm Chemurgic Council, Inc., Columbus, Ohio | 1 |
| National Research Council, Washington, D. C. | 1 |
| Norman, Prof. A. G., Ames, Iowa | 2 |
| Prescott, Prof. Gerald W., Albion, Mich. | 16 |
| Rands, Dr. Robert D., Washington, D. C. | 1 |
| Reed, Dr. George M., Brooklyn, N. Y. | 7 |
| Regelson, Mr. Ruben, Brooklyn, N. Y. | 20 |
| Rentschler, Dr. Harvey C., Bloomfield, N. J. | 1 |
| Rogers, Miss Matilda, New York, N. Y. | 1 |
| Romer, Miss Caroline S., Summit, N. J. | 3 |
| Rothert, Mr. Otto A., Louisville, Ky. | 1 |
| Sampson, Miss Kathleen, Aberyswyth, Wales | 1 |
| Sarton, Dr. George, Cambridge, Mass. | 4 |
| Shelmire, Dr. Bedford, Dallas, Tex. | 6 |
| Sherff, Dr. Earl Edward, Chicago, Ill. | 1 |
| Stanley, Dr. Wendell M., Princeton, N. J. | 9 |
| Sterling, Mrs. Robert D., New York, N. Y. | 1 |
| Svenson, Dr. Henry K., Brooklyn, N. Y. | 1 |
| Swallen, Mr. J. R., Washington, D. C. | 1 |

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|---|---|
| Texas Gulf Sulphur Company, Houston, Tex. | 1 |
| Textile Foundation, Washington, D. C. | 1 |
| Trager, Miss Louise, Chicago, Ill. | 1 |
| Tschirky, Mr. Oscar, New York, N. Y. | 1 |
| Twin Trees Gardens, Lynbrook, L. I. | 1 |
| U. S. Sugar Corporation, Clewiston, Fla. | 1 |
| Walker, Mr. E. H., Washington, D. C. | 1 |
| Winslow, Mr. E. J., Brattleboro, Vt. | 3 |
| Wolfrom, Prof. M. L., Columbus, Ohio | 10 |
| Total | 485 |

## Parts of Publications

(Exclusive of Government Documents)

| | |
|---|---|
| American Begonia Society, Long Beach, Cal. | 2 |
| American Fern Society | 3 |
| American Horticultural Society, Washington, D. C. | 3 |
| American Potash Institute, Washington, D. C. | 4 |
| American Soybean Association, Hudson, Iowa | 12 |
| Ames, Prof. Oakes, Cambridge, Mass. | 7 |
| Avinoff, Mr. Andrey, Pittsburgh, Pa. | 1 |
| Bailey, Dr. Liberty Hyde, Ithaca, N. Y. | 3 |
| Boivin, Mr. Bernard, Montreal, P. Q. | 1 |
| Campbell Soup Company, Dept. of Agricultural Research, Riverton, N. J. | 1 |
| Carnegie Institution of Washington, Washington, D. C. | 2 |
| Castetter, Dr. E. F., Albuquerque, N. M. | 5 |
| Chilean Nitrate Educational Bureau, Inc., New York, N. Y. | 1 |
| Corbett, Mr. C. E., Sao Paulo, Brazil | 1 |
| Cranberry Canners, Inc., Hanson, Mass. | 24 |
| Davey Tree Expert Company, Kent, Ohio | 1 |
| DuPont de Nemours & Company, Wilmington, Del. | 6 |
| Eugenics Society of Northern California, Sacramento, Cal. | 3 |
| Fairchild, Dr. David, Coconut Grove, Fla. | 1 |
| Fisher Scientific Company, Pittsburgh, Pa. | 4 |
| Free, Mr. Montague, Brooklyn, N. Y. | 16 |
| Frylink, A., & Sons, Inc., Babylon, L. I. | 9 |
| Gager, Dr. C. Stuart, Brooklyn, N. Y. | 65 |
| General Biological Supply House, Chicago, Ill. | 100 |
| Givaudan-Delawanna, Inc., New York, N. Y. | 2 |
| Graves, Dr. Arthur Harmount, Brooklyn, N. Y. | 28 |
| Gregory, Mr. Walton C., Charlottesville, Va. | 1 |
| Gundersen, Dr. Alfred, Brooklyn, N. Y. | 40 |

| | |
|---|---|
| Harper, Dr. Roland M., University, Ala. | 1 |
| Harvard Forest, Harvard University, Petersham, Mass. | 9 |
| Herb Society of America, Boston, Mass. | 1 |
| Illinois Audubon Society, Chicago, Ill. | 4 |
| Ingersoll, Mrs. Raymond V., Brooklyn, N. Y. | 1 |
| Jenkins, Mr. Charles F., Germantown, Philadelphia, Pa. | 4 |
| John Innes Horticultural Institution, London, England | 5 |
| Kelley, Mr. Arthur Pierson, Landenberg, Pa. | 1 |
| McFarland, Dr. J. Horace, Harrisburg, Pa. | 1 |
| McFarland, J. Horace Company, Harrisburg, Pa. | 2 |
| Medical Society of the County of Kings, Brooklyn, N. Y. | 12 |
| Mellon Institute, Pittsburgh, Pa. | 2 |
| Miner, Miss Frances, New York, N. Y. | 1 |
| National Paint, Varnish and Lacquer Association, Inc., Washington, D. C. | 2 |
| National Research Council, Washington, D. C. | 1 |
| National Research Council of Canada, Ottawa, Canada | 1 |
| New Jersey State Horticultural Society, New Brunswick, N. J. | 1 |
| New York Association of Biology Teachers, New York, N. Y. | 7 |
| Parrabère, Dr. Arnoldo Pedro, Montevideo, Uruguay | 2 |
| Pennsylvania, University of. Library, Philadelphia, Pa. | 3 |
| Philippart, Mr. Georges, New York, N. Y. | 1 |
| Reed, Dr. George M., Brooklyn, N. Y. | 77 |
| Roosevelt Wildlife Forest Experiment Station, Syracuse, N. Y. | 2 |
| Rusk, Miss Hester M., Brooklyn, N. Y. | 12 |
| School Garden Association, New York, N. Y. | 5 |
| School Nature League, New York, N. Y. | 8 |
| Schulman, Mr. Edmund, Tucson, Ariz. | 1 |
| Shaw, Mr. Earl B., Worcester, Mass. | 1 |
| Sociedad Venezolana de Ciencias Naturales, Caracas, Venezuela | 1 |
| Southern Methodist University, Dallas, Tex. | 2 |
| Sperry, Dr. O. E., Alpine, Tex. | 1 |
| Stanford University Library, Palo Alto, Cal. | 4 |
| Svenson, Dr. Henry K., Brooklyn, N. Y. | 2 |
| Textile Colorist, Inc., New York, N. Y. | 1 |
| U. S. Golf Association, Green Section, Washington, D. C. | 7 |
| Upsala Botaniska Institutionen, Upsala, Sweden | 5 |
| Wallerstein Laboratories, New York, N. Y. | 2 |
| White, Miss Wilbarine, Oklahoma City, Okla. | 1 |
| Wilderness Society, Washington, D. C. | 1 |
| Wyoming University, Botany Department, Laramie, Wyo. | 28 |
| Yale University, School of Forestry, New Haven, Conn. | 4 |
| Total | 573 |

### PORTRAITS AND PHOTOGRAPHS

| | |
|---|---|
| Gager, Dr. C. Stuart, Brooklyn, N. Y. | 6 |
| New York Botanical Garden, New York, N. Y. | 1 |
| Reed, Dr. George M., Brooklyn, N. Y. | 2 |
| Total | 9 |

### AUTOGRAPH LETTERS

| | |
|---|---|
| Gager, Dr. C. Stuart, Brooklyn, N. Y. | 3 |

### MISCELLANEOUS

Esso Touring Service, New York., 8 road maps.

Gager, Dr. C. Stuart, Brooklyn, N. Y., Business card of Mr. Herbert Gray Torrey (son of Dr. John Torrey); 1 map; 1 newspaper clipping; 1 typewritten letter; Obituary notice, Dr. Hans Schinz; Thesis and relative material.

Hyde, Mrs. Alice Earle, Waterbury, Conn., Duplicates not counted in yearly statistics: 8 parts.

Regelson, Mr. Ruben, Brooklyn, N. Y., Duplicates not counted in yearly statistics: 7 parts; 3 pamphlets.

Romer, Miss Caroline S., Summit, N. J., Duplicates not counted in yearly statistics: 5 volumes in 1; 2 newspaper clippings.

Winslow, Mr. E. J., Brattleboro, Vt., Duplicates not counted in yearly statistics: 63 parts.

## Department of Plants

### LIVING PLANTS

Bernhardt, Dr. A., Barrancas, Fla. 379 miscellaneous plants of 17 genera.

Bobbink & Atkins, Rutherford, N. J. 152 Roses in 40 varieties, 1 Double White Peach.

Brockaway, Mrs. O. A., Brooklyn, N. Y. 1 Sweet Lime.

Bullard, Mr. H. O., Hackensack, N. J. 11 species of Cacti.

Conard-Pyle Co., West Grove, Pa. 66 Cannas, 85 Roses in 20 varieties.

Cummings, Mr. Alex., Bristol, Conn. 1 *Picea pungens nana.*

Dreer, Inc., Henry A., Phila., Pa. 1 Rose "Irish Fire Flame."

Duane, Mr. John H., N. Y., N. Y. 16 Orchids in 8 varieties.

Department of Parks, N. Y., N. Y. 1 *Cedrus atlantica glauca.*

Department of Parks, Rochester, N. Y. 20 Scions of *Acer saccharum monumentale*, and *Acer saccharum columnare.*

Freile, Mr. Louis, Brooklyn, N. Y. 1 Mango.

Garden in the Woods, South Sudbury, Mass. 1 *Lobelia cardinalis alba.*

Graves, Dr. Arthur H., Brooklyn, N. Y. 2 *Carya*, 1 *Castanea.*

Greiff, Mr. Victor, Queens, N. Y. 1 *Cereus alacriportanus.*
Hallauer, N. A., Webster, N. Y. 3 *Dianthus.*
Haynes, Miss Mabel, Brooklyn, N. Y. 1 *Daphne odorata marginata.*
Hildebrandt, Mr. A. F., Penn State, Pa. 12 *Camptosorus rhizophyllus.*
Intercontinental Rubber Co., Salinas, Calif. 10 plants of guayule.
Jackson and Perkins, Newark, N. Y. 55 Roses in 13 varieties.
de Krafft, Mr. W., N. Y., N. Y. 200 *Ilex* cuttings in 2 varieties.
Lieb, Mr. Werner, New Rochelle, N. Y. 2 *Pilea involucrata.*
Malmborg, Mr. G. E., Elizabethtown, Pa. 1 *Victoria Cruziana.*
Neiley, Mr. Charles, F., Great Neck, L. I. 1 *Euphorbia grandicornis,* 1 *Melocactus* sp., 1 *Opuntia brasiliensis,* 2 *Opuntia* sps., 1 *Sequoia sempervirens.*
Phenix, Mrs. Spencer, Chocorua, N. H. 2 *Pogonia trianthophora.*
Princeton Nurseries, Princeton, N. J. 6 Peach trees.
Seabury, Mrs. Samuel, N. Y., N. Y. 3 *Albezzia Julibrissin rosea.*
Scott, Mrs. Arthur Hoyt, Media, Pa. *Artemisia Stelleriana, Hosta Sieboldiana, Hosta caerulea, Pelargonium graveolens, Myosotis dissitiflora, Begonia Evansiana, Sedum reflexum, Sedum ternatum, Sedum anglicum, Sempervivum* in 6 species.
Schretzlemier, Mr. G., Brooklyn, N. Y. 1 *Hippeastrum.*
Steckler, Mrs. Peter, Tucson, Arizona. 41 Cacti in 17 varieties, 1 Agave.
Stoll, Mr. F., Brooklyn, N. Y. 1 large clump *Houstonia caerulea.*
Svenson, Dr. H. K., Brooklyn, N. Y. 1 clump *Solidago glaberrima,* 1 clump *Gentiana puberula.*
Totty, Miss Helen M., Madison, N. J. 27 grafted Roses.
Tricker, Mr. Charles L., Saddle River, N. J. 3 *Butomus umbellatus,* 1 *Nelumbium luteum,* 41 Tropical Waterlilies in 37 varieties.
Waller, Prof. A. E., Columbus, Ohio. 6 *Hevea brasiliensis.*
Wayside Gardens, Mentor, Ohio. 42 miscellaneous plants and shrubs.
Wheller, Mr. Wilfrid, Hatchville, Mass. 1 clump *Mentha piperita* × *Mentha spicata.*
Wilson, Mr. Laurence, Butler, Pa. 6 cuttings of English Ivy.
Whittingham, Mr. A., Andover, N. J. 100 clumps *Anemonella thalictroides,* 10 cl. *Orchis spectabilis,* 5 cl. *Caulophyllum thalictroides,* 20 cl. *Hepatica triloba,* 20 cl. *Hepatica acutiloba,* 35 cl. *Caltha palustris,* 20 cl. *Viola* sp., 50 cl. *Saxifraga virginiana,* 5 cl. *Senecio aureus,* 15 cl. *Ranunculus hispida,* 3 cl. *Adiatum pedatum,* 5 cl. *Camptosorus rhizophyllus,* 4 cl. *Mitchella repens,* 4 cl. *Lycopodium* sp., 1 cl. *Cypripedium parviflorum.*

## SEED PACKETS

Bernhardt, Mr. A. Barrancas, Fla. (50)
Brockaway, Mrs. O. A., Brooklyn, N. Y. (3)
Cohen, Mr. Julius, Brooklyn, N. Y. (2)
Darke, Mr. F. E., Santa Cruz, Calif. (1)

de Krafft, Mr. W., N. Y., N. Y. (1)
Hyde, Mrs. A. E., Waterbury, Conn. (11)
Scott, Mrs. Arthur Hoyt, Media, Pa. (1)
Steckler, Mr. Peter, Tucson, Arizona (4)
Stumpp & Walter Co., New York, N. Y. (33)

## Phanerogamic Herbarium

Ek, Mr. C. M., 510 miscellaneous specimens collected in Indiana.
Fraser, Rev. S. V., 4 Eleocharis specimens collected in Kansas.
Hanmer, Mr. C. C., 73 miscellaneous specimens collected on Fishers Island, New York.
Harper, Dr. R. M., 47 miscellaneous specimens collected in Alabama.
Lepage, Rev. E., 35 miscellaneous fern specimens collected in Canada.
Reynolds, Mr. H. C., 10 Eleocharis specimens collected in Nebraska.
Waterfall, Mr. U. T., 3 Eleocharis specimens collected in Oklahoma.

## Cryptogamic Herbarium

Stirckland, Mr. J. C., Jr., 18 miscellaneous specimens of algae collected in Virginia.

## For the Department of Elementary Instruction

Bayne, Mrs. Laura M., African materials from native plant sources for use in classwork.
Butler, Mrs. Glentworth R., One prize cup competed for by the girls in the outdoor garden; one subscription to Nature Magazine.
Faculty of P. S. 125, The Mary E. Quinn Memorial Fund of $303.09 for gates at the children's garden.
Firestone Tire & Rubber Company, Pictures of synthetic rubber manufacturing for use in classwork.
Flowerfield Bulb Farm, Two hundred Muscari bulbs for use in children's garden area.
Gager, Dr. C. Stuart, Two gold medals as prizes for outdoor garden work; one book for the children's clubroom library.
Gager, Mrs. C. Stuart, One book for the children's clubroom library.
Garden Teachers Association, One prize cup competed for by the boys of the outdoor garden.
General Tire & Rubber Company, Pictures of guayule, one specimen plant, twenty-five booklets on guayule for use in classwork.
Goodman, Mr. and Mrs. Joseph, One prize cup in memory of Bernard Goodman competed for by the boys of the outdoor garden.
Kam, Mr. Harold, Flower scissors and knives for the children's garden.
Mackey, Miss Mary R., Gladiolus corms for the children's garden.
Perkins, Mrs. Charles E., $25.00 honorarium for children's garden work.

Selverstone, Mrs. Jonas, Two books for the children's clubroom.

Shaw, Miss Ellen Eddy, Two gold honor pins for work in the children's garden.

*Note:* Gifts of money from various sources have been added to the Endowment Fund for the Department of Elementary Instruction, and are included in the total under the heading Ellen Eddy Shaw Endowment Fund (page 00).

## Miscellaneous

Farwell, Dr. Oliver A., Lake Linden, Mich., 1 photograph.

McFarland, Mr. J. Horace, Harrisburg, Pa., 2 photographs of the Arthur Hoyt Scott Garden and Horticultural Medal.

New York Botanical Garden, 1 photograph of Mrs. N. L. Britton.

Peters, Mrs. William Sterling, Brooklyn, N. Y., 1 porcelain flower container and base.

Van Horne, Mr. V. L., Brooklyn, N. Y., 3 prints from negatives made in the Brooklyn Botanic Garden.

## APPENDIX 2

## PUBLICATIONS BY THE BOTANIC GARDEN PERSONNEL DURING 1942

**Ashwell, G. Elizabeth.**

9 abstracts for Biological Abstracts.

**Benedict, Ralph C.**

Fern Lantern Slides to Lend. *Amer. Fern Jour.* **32**: 38–39. January–March.

**Carroll, Michalena LeFrere, and Ellen Eddy Shaw, Margaret M. Dorward, and Elsie Twemlow Hammond.**

Children come visiting. *Educational series, Dept. of Elementary Instruction.* June.

**Cheney, R. H.**

Tea substitutes in the United States. *Jour. N. Y. Bot. Gard.* **43**: 117. May.

New sources for flavors. *Amer. Perfumer and Essential Oil Rev.* **44**: 43. June.

Unusual flavor sources. Proc. 33rd Ann. Convention Flav. Ext. Mfg. Assoc. of the U. S., May 18, 1942, p. 29.

Oxygen consumption in caffeinized Arbacia eggs. (Abstract.) *Biol. Bull.* **83**: 296. Oct.

Caffeine effect on fertilization and development of Arbacia eggs. (Abstract.) *Biol. Bull.* **83**: 297. Oct.

Inhibitory effect of caffeine on oxygen consumption in Arbacia eggs. (Abstract.) *Anat. Rec.* **84**: 43. Dec.

Development of Arbacia eggs in caffeinized sea water. (Abstract.) *Anat. Rec.* **84**: 50. Dec.

China tea substitutes in the New York area. (Abstract.) *Amer. Jour. Bot.* **29**: 5s. Dec.

**Doney, Charles F.**

Trees for street and dooryard. *University of State of New York, Bulletin to the Schools* **28**: 231–234, 268.

Unusual trees in the Brooklyn Botanic Garden. *Brooklyn Bot. Gard. Record* **31**: 39–43. January.

**Dorward, Margaret M., and Montague Free.**

The Victory vegetable garden. *Brooklyn Bot. Gard. Leaflets* XXIX$^5$. April.

**Dorward, Margaret M., and Ellen Eddy Shaw, Michalena LeFrere Carroll, and Elsie Twemlow Hammond.**

Children come visiting. *Educational series, Dept. of Elementary Instruction.* June.

**Free, Montague.**

Caring for your holiday plants. *The Sun* (New York). January 2.

Start your perennials now. *The Sun* (New York). February 13.

The Brooklyn Botanic Garden exhibit of the art of graftage. *Brooklyn Bot. Gard. Leaflets.* Ser. 29, No. 3–4. March.

Thoughts on spring pruning. *Flower Grower* **29**: 128–129. March.

Report of the Horticulturist for· 1941. *Brooklyn Bot. Gard. Record* **31**: 124–128. April.

The Victory vegetable garden. *Brooklyn Bot. Gard. Leaflets.* Ser. 29, No. 5. April.

Flower garden pointers. *Flower Grower* **29**: 184–185. April.

Victory vegetable gardens. *The Sun* (New York). April 3.

Victory vegetable growing. *The Sun* (New York). April 10.

Planning a small kitchen garden. *The Sun* (New York). April 17.

Thinning, staking and cultivating in the Victory vegetable garden. *The Sun* (New York). April 24.

Green grow the lilacs. *Garden Digest* **14**: 5–7. May.

Flower garden reminders. *Flower Grower* **29**: 227–228. May.

Victory vegetable gardening. *The Sun* (New York). May 8.

Victory vegetable gardens. *The Sun* (New York). May 22.

June jobs. *Flower Grower* **29**; 280–281. June.

Victory vegetable gardening. *The Sun* (New York). June 5.

July reminders. *Flower Grower* **29**: 321–322. July.

Starting winter vegetables. *The Sun* (New York). July 10.

Animal and vegetable pests. *The Sun* (New York). July 17.

Time to prune extra shoots. *The Sun* (New York). July 24.

August reminders. *Flower Grower* **29**: 365. August.

Victory vegetable gardening. *The Sun* (New York). August 7.

Jobs for September. *Flower Grower* **29**: 411. September.

Storing your victory crops. *The Sun* (New York). September 4.

October reminders. *Flower Grower* **29**: 445. October.

November chores. *Flower Grower* **29**: 493. November.

December jobs. *Flower Grower* **29**: 534. December.

Caring for Christmas plants. *The Sun* (New York). December 31.

**Gager, C. Stuart.**

Review of Smallwood and Smallwood, "Natural history and the American mind." *Ecology* **23**: 18. Jan.

Memorial and Gift trees [in the Brooklyn Botanic Garden]. *Brooklyn Bot. Gard. Record* **31**: 44–47. January.

A garden of herbs. *Internat. Flower Show Official Catalog.* 134. March.

Thirty-first annual report of the Brooklyn Botanic Garden: Report of the director. *Brooklyn Bot. Gard. Record* **31**: 55–90. April.

Book notice of Kelsey and Dayton, Standardized plant names, second edition. *Ecology* **23**: 245. April.

Theatres, gardens, and horticulture. (Address in acceptance of the 1941 Arthur Hoyt Scott Horticultural award and in dedication of the new open-air theatre at Swarthmore College.) *Science* **95**: 635–639. June.

Book notice of White, Dyer, and Stone, "The succulent Euphorbicae (Southern Africa)." *Ecology* **23**: 382. July.

Who established the Elgin Botanic Garden? *Science* **96**: 439–441. Nov. 13.

Tribute to the late William Francis Ganong. *William Francis Ganong Memorial,* pp. 17–18. Saint Johns, New Brunswick. 1942.

**Graves, Arthur Harmount.**

Pines of the New York City Region. *School Nature League Bulletin.* Series 12, No. 6. Am. Mus. Nat. Hist. February.

Botany. Revision service (for 1941). *Colliers National Encyclopedia.* April.

Chestnut breeding work in 1941. *Brooklyn Bot. Gard. Record* **31**: 94–99. April.

Report of the Curator of Public Instruction for 1941. *Brooklyn Bot. Gard. Record* **31**: 106–114. April.

Breeding work toward the development of a timber type of blight-resistant chestnut: report for 1941. *Amer. Jour. Bot.* **29**: 622–626. October.

October in the Botanic Garden. *Brooklyn Inst. Bull.* **46**: 30. October.

Of chrysanthemums and herbs. *Brooklyn Inst. Bull.* **46**: 30. November.

Winter in the Botanic Garden. *Brooklyn Inst. Bull.* **46**: 30. December.

79 articles on events at the Brooklyn Botanic Garden, for metropolitan newspapers.

**Graves, Arthur Harmount and Alfred Gundersen.**

Trees in the Brooklyn Botanic Garden. 1942. B. B. G. Guide No. 13. *Brooklyn Bot. Gard. Record* **31**: 1–38. January.

**Gundersen, Alfred.**

Flower structure and the classification of Dicotyledons. *Brooklyn Bot. Gard. Record* **31**: 99–101. April.

Report of the Curator of Plants for the Year 1942. *Brooklyn Bot. Gard. Record* **31**: 120–123. April.

**Gundersen, Alfred and Arthur Harmount Graves.**

Trees in the Brooklyn Botanic Garden. 1942. B. B. G. Guide No. 13. *Brooklyn Bot. Gard. Record* **31**: 1–38. January.

**Hammond, Elsie Twemlow, and Ellen Eddy Shaw, Michalena LeFrere Carroll, and Margaret M. Dorward.**

Children come visiting. *Educational series, Dept. of Elementary Instruction.* June.

**Jordan, William E.**

Report on the Library for 1941. *Brooklyn Bot. Gard. Record* **31**: 133–137. April.

**Miner, Frances M.**

The children's garden. *Educational series, Dept. of Elementary Instruction.* July.

**Reed, George M.**

Iris at the Brooklyn Botanic Garden and the Farmingdale Iris Garden. *Chronica Botanica* **7**: 85, 86. March.

Inheritance of smut resistance in hybrids of Navarro oats. *Amer. Jour. Bot.* **29**: 308–314. April.

Botany. *The New International Year Book.* **1941**: 72–74. April.

Plant pathology. *Brooklyn Bot. Gard. Record* **31**: 90–94. April.

**Reed, George M., and T. R. Stanton**

Susceptibility of Lee × Victoria oat selections to loose smut. *Phytopathology* **32**: 100–102. January.

**Shaw, Ellen Eddy.**

Make this garden your nicest. *Woman's Home Companion,* pp. 70–71. February.

A garden is grand for a child. *Woman's Home Companion,* p. 47. March.

Annual report of the Curator of Elementary Instruction. *Brooklyn Bot. Gard. Record* **31**: 114–119. April.

Gardening for pleasure. *Recreation* **XXXVI**: 35 & 47. April.

Window box gardens. *Woman's Home Companion,* p. 86. July.

Foreword. The Children's Garden. *Educational series, Dept. of Elementary Instruction.* July.

**Shaw, Ellen Eddy and Michalena LeFrere Carroll, Margaret M. Dorward, and Elsie Twemlow Hammond.**

Children come visiting. *Educational series, Dept. of Elementary Instruction.* June.

**Svenson, Henry K.**

Report of the Curator of the Herbarium for 1941. *Brooklyn Bot. Gard. Record* **31**: 128–132. April.

Eleocharis. Published in Kearney and Peebles, Flowering Plants and Ferns of Arizona. *U. S. D. A. Miscell. Publ.* **423**: 163–166. May.

Algunas plantas medicinales de la America del Sur. *El Farmacéutico* **18**: 28–29, 70. July.

South America's contribution in medicinal herbs. *Jour. N. Y. Bot. Gard.* **43**: 174–178. July.

The local flora section (native wild flower garden) of the Brooklyn Botanic Garden. Guide No. 14. *Brooklyn Bot. Gard. Record* **31**: 183–209. July.

# APPENDIX 3

## TALKS, LECTURES, ADDRESSES, AND PAPERS GIVEN BY THE BOTANIC GARDEN PERSONNEL DURING 1942

**By the Director:**

May 23. *Theatres, gardens, and horticulture.* Swarthmore College, Swarthmore, Pa.

June 11. *Brooklyn Botanic Garden: Its organization and work.* Board of Trustees and Garden personnel. At the Garden.

June 22. *The Torrey Botanical Club in perspective.* (Opening remarks at 75th Anniversary Dinner of the Club.) Columbia University.

June 25. *History and organization of the Brooklyn Botanic Garden.* Torrey Botanical Club 75th Anniversary meeting at Brooklyn Botanic Garden.

October 14. *The Brooklyn Botanic Garden and the public.* Opening meeting, Brooklyn Institute of Arts and Sciences, Opera House, Brooklyn Academy of Music.

November 17. *Recent activities of the Botanic Garden.* Woman's Auxiliary of the Brooklyn Botanic Garden. Brooklyn.

**By the Curator of Public Instruction** (Dr. Graves):

January 10. *Breeding the chestnut.* N. Y. Univ., Wash. Square College. Class in Recent Advances of Science.

March 4. *The work of the Brooklyn Botanic Garden.* Fanwood Garden Club, Fanwood, N. J.

March 17. *Breeding the chestnut.* Benjamin Franklin H. S., Manhattan.

March 25. *Growing and marketing our local vegetable crops.* P. S. 42, Manhattan.

March 27. *Plant breeding with special reference to chestnut breeding.* Bayside H. S. Biology Club.

March 31. *Plant breeding with special reference to chestnut breeding.* New Dorp H. S., Staten Island. 2 lectures.

April 14. *Plant diseases.* Benjamin Franklin H. S., Manhattan.

May 5. *Breeding the chestnut.* Biology Club, Hunter College, Manhattan.

May 6. *Breeding the chestnut.* Stuyvesant H. S., Manhattan.

May 13. *Harvesting and marketing small fruits.* P. S. 42, Manhattan.

May 20. *Breeding the chestnut.* Biology Club, Manual Training H. S., Brooklyn.

May 27. *The work of the Brooklyn Botanic Garden.* Staten Island Institute, New Brighton, S. I.

June 3. *Plant diseases.* James Madison H. S., Brooklyn.

October 22. *Fruits.* P. S. 42, Manhattan.

December 17. *Rubber.* P. S. 42, Manhattan.

**By the Curator of Elementary Instruction** (Miss Shaw):

January 24. *Victory gardens.* Brooklyn Assistants to Principals Association. At the Waldorf Astoria.

February 16. *Victory gardens.* Brooklyn Heights Garden Club. At the Hotel Bossert.

February 17. *Victory gardens for boys and girls.* Federated Garden Clubs of Long Island. At Garden City Hotel.

February 18. *Victory garden courses at the Brooklyn Botanic Garden.* Victory Garden Meeting. At the Garden.

March 17. *Vegetable gardens.* New York City Branch, Woman's National Farm and Garden Association.

March 25. *Victory gardens for boys and girls.* School Children and Members of New Canaan Garden Club, New Canaan, Conn.

March 30. *How to garden with boys and girls.* Junior Garden Chairmen of Federated Garden Clubs of Long Island. At the Garden.

April 10. *Victory gardens for boys and girls.* Matinecock Garden Club, Glen Cove, L. I.

April 20. *Children and nature.* Mothers' Club, P. S. 85 Queens.

April 27. *Victory gardens.* Hebrew Educational Settlement Neighborhood House.

May 4. *Vegetables for victory gardens.* Midwood Chapter, Women's American Organization for Rehabilitation Training. At Midwood Jewish Center.

May 4. *Victory gardens.* Central Garden Club and Brooklyn Garden Clubs Association.

May 7. *Victory gardens.* Abraham & Straus Garden Center.

May 20. *The Brooklyn Botanic Garden in spring.* Brooklyn Section, Public School Kindergarten Association. At the Garden.

June 15. *The value of gardens for boys and girls.* P. S. 241 Parent-Teachers Association.

June 25. *The victory garden.* Garden Clubs of Brooklyn. At the Garden.

June 25. *Graduation address.* P. S. 241.

October 13. *Visiting classes at the Brooklyn Botanic Garden.* Brooklyn Assistants to Principals Association. At the Neighborhood Club.

October 19. *Children's gardens.* Garden Study Club of Short Hills, N. J.

November 2. *Plant propagation.* Flower Hill Garden Club, Manhasset, L. I.

November 4. *Arista address.* Girls Commercial High School.

November 10. *The patriotic background of the United States.* P. S. 241 Parent-Teachers Association.

November 17. *Mrs. Glentworth R. Butler's interest in the children's work of the Brooklyn Botanic Garden.* The Annual Meeting of the Woman's Auxiliary.

November 20. *Plant study in relation to the classroom program in elementary and junior high schools.* New York Society for the Experimental Study of Education.

November 24. *Dedicatory address at tree planting in memory of the Nature Teacher of the school.* P. S. 96 Queens.

November 28. *Educational work for children at the Brooklyn Botanic Garden.* Société canadienne d'Histoire Naturelle. Montreal Botanical Garden.

November 28. *Children's work at the Brooklyn Botanic Garden.* Parents of children in Practice Class at Montreal Botanical Garden.

**By the Curator of Plants** (Dr. Gundersen):

October 31. *The Role of Plants in Animal Evolution.* Torrey Botanical Club. At the Garden.

**By the Curator of the Herbarium** (Dr. Svenson):

January 13. *Ecuador and Peru.* Men's Club, Reformed Dutch Church of Flatbush.

February 11. *Plants of the coast of Ecuador and Peru.* Horticultural Club of Boston. At the Parker House, Boston, Mass.

March 18. *The coast and mountains of Ecuador.* Society of Biology and Medicine, Brooklyn College.

April 8. *South America's contribution in medicinal herbs.* Herb Conference, New York Botanical Garden.

April 14. *The Brooklyn Botanic Garden.* Daughters of Pennsylvania in New York. At John Wanamaker, N. Y.

April 17. *Ecuador and Peru.* Brooklyn Botanic Garden Staff. At the Garden.

April 21. *Fruits, vegetables and markets of Ecuador.* Federal Plant Quarantine Club of New York. At the Federal Building, N. Y.

April 27. *Substitutes for herbs and spices.* The Herb Society of America Luncheon. At the Hotel Wellington, N. Y.

April 28. *The coast of Ecuador and Peru.* Linnean Society of New York. At the American Museum of Natural History, N. Y.

May 4. *Ecuador and Peru.* Cambridge Club. At the home of Mrs. George B. Germann, Brooklyn, N. Y.

May 14. *The vegetation of Ecuador and Peru.* Contemporary Club. At the Garden.

June 23. *Modern taxonomy and its relation to geography.* Torrey Botanical Club. At the New York Botanical Garden.

October 28. *Agriculture in South America.* Bedford Farmers Club. At the home of Mr. L. H. Wood, Mt. Kisco, New York.

November 2. *The vegetation of western South America.* Torrey Botanical Club. At the American Museum of Natural History, N. Y.

December 18. *The coast of Ecuador and Peru.* Explorers Club. At the American Museum of Natural History, N. Y.

**By the Curator of Plant Pathology** (Dr. Reed):

June 3. *Inheritance studies in disease resistance.* Biology Club, Manual Training High School. At the Garden.

June 25. *The status of Plant Pathology in 1867 and in 1942.* Seventy-fifth Anniversary, Torrey Botanical Club. At the Garden.

**By the Horticulturist** (Mr. Free):

January 20. *Brooklyn Botanic Garden Victory Garden program.* Conference on National Victory Gardens, Westbury, L. I.

February 18. *Unusual shrubs.* Horticultural Society of New York.

March 4. *Dig for Victory.* Paderewski Testimonial Fund, Inc., New York City.

April 2. *Pruning.* Men's Garden Club of New York, New York City.

April 14. *Rock gardens.* Westchester and Fairfield Horticultural Society, Greenwich, Conn.

June 9. *New notions in rose growing.* At the Garden.

September 15. *Plants in the home.* Munsey Park Garden Group, Manhasset, L. I.

November 5. *Preparing for the spring garden.* Englewood (N. J.) Garden Club.

November 13. *Plants in the home.* Garden Club of Darien (Conn.).

December 15. *Budding, grafting and cuttings.* Horticultural Society of New York.

**By the Resident Investigator (Economic Plants)** (Dr. Cheney):

February 13. *Plants and animals of the Pacific Coast in Kodachrome.* Anaphy Biology Society, Long Island University. Brooklyn.

May 18. *Unusual flavoring sources from plants.* 33rd Annual Convention of the Flavoring Extract Manufacturers' Association of the United States, Inc. Hotel Pennsylvania, Manhattan.

May 20. *Drug plant sources, shortages, and production by cultivation in the United States.* New York Academy of Medicine, Manhattan.

November 23. *Herb teas.* Brooklyn Botanic Garden.

**By the Assistant Curator of Elementary Instruction** (Miss Dorward):

March 27. *Victory gardens.* Belle Harbor Garden Club.

**By Instructors:**

*Miss Carroll:*

April 15. *Color.* Brooklyn Teachers Association Class in Flower Arrangement. At the Garden.

April 22. *Color.* Brooklyn Teachers Association Class in Flower Arrangement. At the Garden.

November 20. *Art and illustration make use of plant study and plant life.* New York Society for the Experimental Study of Education.

*Miss Miner:*

March 12. *The children's garden of the Brooklyn Botanic Garden.* Elementary School Children of Summit, N. J.

March 24. *The children's garden of the Brooklyn Botanic Garden.* Class at New York University in Materials of Instruction.

November 10. *How to interest children in plants.* Castle Manor Garden Club, Staten Island.

November 20. *Junior high school science in connection with plant study.* New York Society for the Experimental Study of Education.

*Miss Rusk:*

February 27. Vegetative propagation. Class from Girls Commercial H. S. At the Garden.

March 2. Vegetative propagation. Class from Girls Commercial H. S. At the Garden.

March 24. Variation and evolution. Biology Club, Stuyvesant H. S., Manhattan.

March 31. Spring wild flowers. Class at Benjamin Franklin H. S., Manhattan.

May 6. Vegetative propagation. Class from New Jersey (Montclair) Normal School. At the Garden.

June 11. Variation and evolution. Biology Club, Jamaica H. S.

September 22. Edible wild plants. Ramapo Garden Club, Suffern, N. J.

September 30. Edible wild plants. Short Hills Garden Club, Short Hills, N. J.

October 23. Vegetative propagation. Biology Club, James Madison H. S., Brooklyn.

November 7. Adjusting the environment to the needs of plants. Class from N. Y. U. At the Garden.

November 14. Some wild plants which are both beautiful and useful. Barnard Club, Manhattan.

December 3. Edible wild plants. N. Y. Chapter American Nature Study Society, Manhattan.

December 15. Water cultures; vegetative propagation. Class from Pratt Institute. At the Garden.

**By Research Assistant** (Dr. Utter):

January 30. *Races of the oat smuts and their hybridization.* Biological Seminar, Princeton University, Princeton, N. J.

March 24. *Gardening in the City.* Utopia Civic Association, Flushing, L. I.

May 15. *Races of the oat smuts and their hybridization.* Biology Seminar, New York University. Manhattan.

**By Curatorial Assistant** (Miss Ashwell):

February 25. *Soil conservation.* Brooklyn College. At the Garden.

February 27. *Plant propagation.* Girls Commercial High School. At the Garden.

March 2. *Plant propagation.* Girls Commercial High School. At the Garden.

May 26. *Soil conservation.* Stuyvesant High School, Manhattan.

Oct. 7. *Soil conservation.* Brooklyn College. At the Garden.

**By Curatorial Assistant** (Miss Clarke):

April 16. Planning the Victory Garden. Samuel Tilden High School. Brooklyn.

April 23. Varieties of Vegetables. Samuel Tilden High School.

November 19. Bulbs for the Home. Madison, N. J. Garden Club.

**By the Foreman Gardener** (George R. Bishop):

January 16. *Care of house plants.* Essex Fells (N. J.) Garden Club.

March 4. *House plants, care and propagation.* Triboro Hospital, Jamaica, N. Y.

March 16. *Shrubs for the home landscape.* Brooklyn and Queens Light and Power Company, Brooklyn.

**By the Rose Grower** (S. R. Tilley):

June 16. *The care of roses.* Bay Ridge Garden Club, Brooklyn.

## APPENDIX 4

### RADIO TALKS GIVEN DURING 1942

**By the Curator of Public Instruction** (Dr. Graves):

*From Station WNYC:*

April 10. Making new chestnut trees.

**By the Curator of the Herbarium** (Dr. Svenson):

*From Station WNYC:*

January 16. Ecuador, its coast and mountains.

November 27. The history of Cinchona and quinine.

**By the Curator of Elementary Instruction** (Miss Shaw)

*From Station WOR:*

March 21. Victory gardens.

*From Station WNYC:*

December 11. Plants for Christmas.

**By the Horticulturist** (Mr. Free):

*From Station WNYC:*

January 2. House plants that can take it.
March 27. Victory gardens.
June 26. The story of the Dahlia.
October 16. Get ready for next year's Victory garden.

*From Station WJZ:*

April 9. Victory gardens. (Woman of Tomorrow Program.)

**By the Resident Investigator (Economic Plants)** (Dr. Cheney):

February 27. New healing agents from plants. Station WNYC. (Brooklyn Botanic Garden Radio Series.)

**By Instructors:**

Miss Miner:

*From Station WNYC:*

March 13. It's time to start the children's garden.

Miss Rusk:

*From Station WNYC:*

May 15. Edible wild plants.

**By Curatorial Assistant** (Miss Ashwell):

*From Station WNYC:*

April 24. Some native shrubs.

**By the Curatorial Assistant** (Miss Clarke):

*From Station WNYC:*

May 1. What are biennials?
October 30. Hardy annuals for next year's bloom.

**By the Assistant in Woody Plants** (Mr. Doney):

*From Station WNYC:*

February 13. Good hedge plants.

**By Research Assistant** (Dr. Utter):

*From Station WNYC:*

May 29. Bacteria—friend and foe.

November 13. Plants need a complete diet.

**By the Foreman Gardener** (George R. Bishop):

*From Station WNYC:*

May 12. Waterlilies in the home garden.

## APPENDIX 5

### FIELD TRIPS CONDUCTED, 1942

**By the Curator of Public Instruction** (Dr. Graves):

May 23. Committee from N. Y. Association of Biology Teachers. Local Flora Area. Brooklyn Botanic Garden.

June 6. N. Y. Association of Biology Teachers. Field Day at Lake Nawahunta, Bear Mountain, N. Y., for trees and shrubs.

June 21. Torrey Botanical Club. Inwood Park, Manhattan.

**By the Curator of the Herbarium** (Dr. Svenson):

May 9–10. Green Mountain Club. Lake Tiorati, near Arden, New York.

June 26–27. Torrey Botanical Club. New Jersey Pine Barrens.

June 28. Torrey Botanical Club. Salt marsh at Croton Point, New York.

**By Instructor** (Miss Rusk):

June 6. N. Y. Association of Biology Teachers. Woodland group. Bear Mountain, N. Y.

October 4. Torrey Botanical Club. Richmond, S. I.

**By the Assistant in Woody Plants** (Mr. Doney):

May 19. Flavoring Extract Manufacturers Association. At the Garden.

**By Curatorial Assistant** (Miss Ashwell):

September 26. Torrey Botanical Club. Local Flora Section of the Brooklyn Botanic Garden.

# APPENDIX 6

## MEETINGS OF ORGANIZATIONS AT BROOKLYN BOTANIC GARDEN, 1942

January 13. Flower arrangement class exhibit (Matilda Rogers).
February 26. Woman's Auxiliary, Brooklyn Botanic Garden.
March 6. Woman's Auxiliary, Brooklyn Botanic Garden.
March 30. Junior Garden Chairmen, Federated Garden Clubs of Long Island.
April 30. Personnel of Brooklyn Museum.
May 4. Woman's Auxiliary, Brooklyn Botanic Garden.
May 6. Woman of '76 Chapter, N.S.D.A.R.
May 13. Brooklyn Assistants to Principals.
May 13. National Association of Gardeners, N. Y. City Branch.
May 14. Contemporary Club.
May 19. Flavoring Extract Manufacturers' Association of the United States.
May 20. New York Public School Kindergarten Association, Brooklyn Section.
May 20. American Nature Study Society.
May 22. Delphian Society, Brooklyn Heights Chapter.
June 9. Horticultural Society of New York.
June 11. Board of Trustees, Brooklyn Institute of Arts & Sciences.
June 15. Bay Ridge Garden Club.
June 25. Torrey Botanical Club.
June 25. Representatives of Brooklyn Garden Clubs.
June 25. Brooklyn Nature Club.
July 1. Representatives of Brooklyn Garden Clubs.
October 5. Department of Natural Sciences, Brooklyn Institute of Arts and Sciences.
October 6. Torrey Botanical Club.
October 23. Englewood Women's Club, Garden Department.
October 31. Torrey Botanical Club.

25 Organizations. Total attendance, 756.

## APPENDIX 7

### REPORT OF PHOTOGRAPHIC WORK

| | | |
|---|---|---|
| Negatives on file December 31, 1941 | | 10,350 |
| Negatives accessioned during 1942 | | 250 |
| Total negatives on file December 31, 1942 | | 10,600 |
| Lantern slides on file December 31, 1941 | | 7,050 |
| Lantern slides accessioned during 1942 | | 80 |
| Total lantern slides on file December 31, 1942 | | 7,130 |
| Kodachrome lantern slides made | | 6 |
| Prints on file December 31, 1941 | | 10,350 |
| Prints made during 1942 | 889 | |
| Used or distributed | 630 | |
| Printed filed during 1942 | | 250 |
| Total prints on file December 31, 1942 | | 10,600 |
| Enlargements made | | 27 |
| Motion pictures made (in technicolor) | | 9 reels |

## APPENDIX 8

### REPORT ON BROOKLYN BOTANIC GARDEN PUBLICATIONS, 1942

#### *Ecology*

Official Organ of the Ecological Society of America. Quarterly. Volume XXIII comprised 35 papers (besides reviews, proceedings, and miscellaneous matter), 500 pages, 2 plates and 182 text figures (as against 34 papers, 472 pages, and 224 text figures in 1941). The circulation at the close of the fiscal year (November 30, 1942) was 951 as against 1,153 one year ago.

The annual budget was $6,189.78, the credit balance $2,631.56, and assets over liabilities $1,704.09 (as against $6,046.61, $1,743.44, and $1,786.57 assets over liabilities in 1941), plus the value of back sets and volumes on hand. Dr. Henry K. Svenson continued on the editorial board as the Brooklyn Botanic Garden representative. Dr. Thomas Park, of the University of Chicago, continued as Zoological Editor. Dr. Charles E. Olmsted, of the

University of Chicago, succeeded Dr. Francis Ramaley, of the University of Colorado, as Botanical Editor.

### *Genetics*

In Cooperation with "Genetics, Incorporated." Bimonthly. Volume XXVII comprised 39 papers, 664 pages, 7 plates and 123 text figures (as against 34 papers, 680 pages, 10 plates and 85 text figures in 1941). At the close of the fiscal year (November 30, 1942) the circulation was 585, the annual budget $8,754.78, and the credit balance $3,249.11 (as against 736, $8,188.05, and $3,086.98 in 1941), plus the value of back sets and volumes on hand. Dr. M. M. Rhoades, of Columbia University, continued as Managing Editor.

### *Brooklyn Botanic Garden Record*

Quarterly. Volume XXXI comprised 249 pages. The April number comprised the Annual Report. The circulation of the Record at the close of the year was 1,399.

### *Leaflets*

One single number and two double numbers were issued. The circulation at the close of the year was 1,370.

### *Contributions and Memoirs*

Numbers 96 and 97 of the *Contributions* were published. No *Memoir* was published.

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Zellner, Mrs. Carl P.
Zimmele, Charles F.
Zimmer, Mrs. Wilson Briggs

## SUMMARY OF MEMBERSHIP

| | | |
|---|---|---|
| Benefactors | | 15 |
| Patrons | | 17 |
| Donors | | 29 |
| Permanent Members | | 72 |
| Life Members | | |
| Through the Botanic Garden | 17 | |
| Through Other Departments | 173 | 190 |
| Contributing Members | | 40 |
| Sustaining Members | | |
| Through the Botanic Garden | 19 | |
| Through Other Departments | 152 | 171 |
| Annual Members | | 405 |
| Total, as of April 9, 1943 | | 939 |

FIG. 1. Herb Garden of Brooklyn Botanic Garden. View facing east, showing Elizabethan knot gardens in center, and Italian wellhead beyond. Cf. Fig. 10. (10,319)

BROOKLYN BOTANIC GARDEN RECORD

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# FOREWORD *

For some 2000 years following the death of Hippocrates (460–359 or 377 B.C.) the "father" of medicine, the investigations of physicians were devoted chiefly to the *remedies* for human ailments. "Medical research," as we know it today, that is, the systematic, organized study of the human body in health and disease, and of human diseases themselves, is a comparatively modern development.

The early remedies for diseases were derived largely, though not exclusively, from the plant world. Thus the science of botany advanced *pari passu* with that of medicine. In fact the botanic garden, as we know it today, has gradually evolved from the early gardens of "simples" established for the purpose of bringing together in one place for convenience of study, the plants used, or that conceivably might be used, in the treatment of disease.

One of the earliest uses of "simple," as a medical term, was by Sir Thomas Elyot in his *Castell of Helth,* published about 1534, where he mentions "a sycknesse" that "may be cured with simples, that is to saye with one onely thinge that is medicinable." These medicinal herbs or "simples" were used alone or in combination, making a compound medicine. Thus, the modern druggist often says, in his advertising, "Prescriptions carefully compounded."

Figure 2 is reproduced from a photograph of two very old wooden "mortars and pestels," such as were used in the earlier period of pharmacy, in New England, in grinding simples and combinations of simples prescribed by the physician. Their use is also illustrated in figures 6 and 7, and on the front cover page.

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* The illustration on the front cover page shows an early 16th century pharmacist pounding herbs with mortar and pestle. From *Ortus Sanitatis,* Strassburg, 1517. (10,633)

It is interesting to note, in passing, that the *pistil* of a flower derived its name from its resemblance to the apothecary's pestle (Latin, *pistillum*, a pounder).

The studies of those early physicians inevitably began to bifurcate, according to what proved to be the major enthusiasm of the student—the disease or the remedy, giving us medicine, pharmacy, and botany, and physicians (as the term is now used), pharmacists, and botanists.

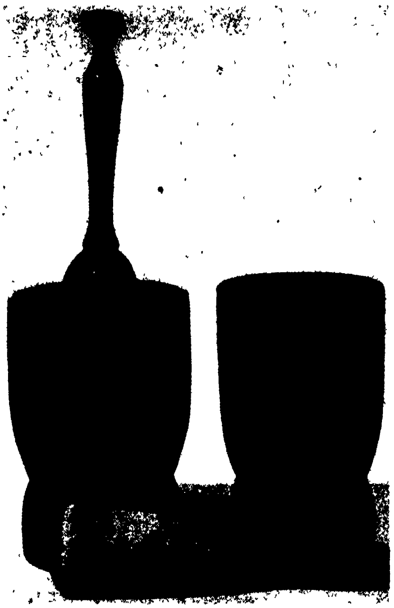

FIG. 2. Mortars and pestles, used at about the Civil War period in the State of Maine. Note, in the figure at the left, the resemblance to the pistil of a flower with its ovary (the mortar), style (handle of the pestle), and stigma (the tip of the pestle). The words pistil and pestle are both derived from the Latin, *pistillum*. (10,632)

The Herb Garden of the Brooklyn Botanic Garden contains both culinary and medicinal herbs. Many herbs, such as rhubarb, peppermint, mustard, Indian corn, and others, have both culinary and medicinal uses.

A GUIDE to the culinary herbs was published in 1942, as the January number of the RECORD.

A medicinal plant garden was a part of the original plan for the development of the Brooklyn Botanic Garden, adopted over thirty years ago. This did not become possible of realization until 1938. Realizing, then, the great extent to which "biologicals" (e.g. pepsin, adrenalin, serums, etc.) and "chemicals" (e.g. sulphanilamide and other compounds) have recently come into medical use, the question arose as to whether plants and plant products were now sufficiently widely used to justify carrying out the original plan for a garden of medicinal plants. After consultation with leading physicians and pharmacists this question was decided in the affirmative, and an advisory committee on the content of the proposed garden was organized. The Botanic Garden is under deep obligations to those who generously offered to serve on this committee, as follows:

### ADVISORY COMMITTEE ON MEDICINAL PLANTS

*Dr. Frederick Schroeder*, Chairman, representing the Long Island College of Medicine and Kings County Medical Society; *Dr. Charles W. Ballard*, College of Pharmacy of Columbia University; *Dr. Ralph H. Cheney*, Brooklyn Botanic Garden and Brooklyn College of Pharmacy; *Dr. William Mansfield*, Albany College of Pharmacy of Union University; *Dr. Erwin E. Nelson*, United States Department of Agriculture; *Mr. F. W. Nitardy*, representing E. R. Squibb & Sons, New York; *Dr. George B. Wallace*, New York Academy of Medicine; *Dr. Frederick J. Wulling*, College of Pharmacy of the University of Minnesota.

The plants in the garden, and described in this GUIDE, constitute the list recommended by this committee.

Because of related interest, a number of poisonous plants, most of them not *officinal* (i.e., official, in the pharmacopoeia of the United States), have been included in a separate part of the garden, as shown on the diagram (Fig. 3). There are, of course, overlaps in all three groups—culinary, poisonous, and medicinal.

The Botanic Garden wishes also to acknowledge here its deep obligation to Dr. Charles B. Ballard, Dean of the College of Pharmacy of Columbia University, a member of our Advisory Committee, who has generously agreed to add to his already full program of professional and administrative duties the preparation of the manuscript on the pharmaceutical part of the Guide.—C. S. G.

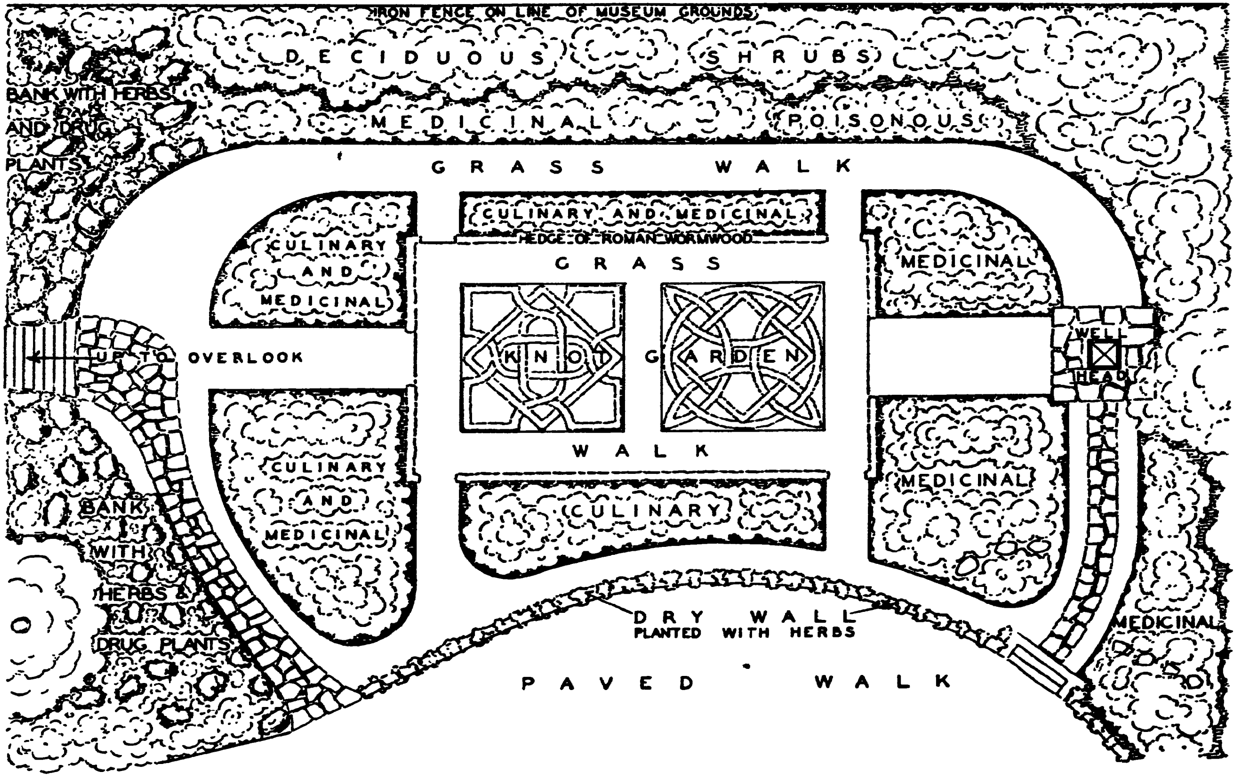

Fig. 3. Map of the Herb Garden, showing location of medicinal and poisonous plants. Cf. Fig. 1. (10,450)

# A BRIEF HISTORICAL SURVEY OF THE USE OF PLANTS IN MEDICINE

### By Arthur Harmount Graves

*Plants and Materia Medica.* The use of plants to cure human ills is probably as old as the human race itself. However, the two other natural kingdoms also—the animals and the minerals—have had and still have a definite and well recognized place in materia medica. Some examples of well known drugs of animal origin are: honey; cantharis, or cantharides (a counter-irritant derived from the dried and powdered bodies of small insects); cod liver oil; pepsin; and the products of endocrine glands, such as thyroid extract. Of mineral drugs, some of the most important are sodium, iodine, mercury, iron, aluminum, manganese, in the form of the element itself, or of compounds of the element; and, of course, the wonderfully potent and effective, recently discovered "sulfa" drugs. Nevertheless the drugs of animal and mineral origin are comparatively few. A glance through the most recent United States Pharmacopoeia (1940) shows that the great majority are derived from plants, and in the use of the term *"materia medica,"* i.e. the *material of medicine*, it is generally understood that plants form the main bulk of the material.

*How Old Is Medicine?* We have said above that the use of plants in medicine is probably as old as the human race; so, likewise, medicine itself, that is, the art of preventing, curing, or alleviating disease, without doubt goes back to very ancient, and probably to prehistoric times. One important consideration must always be kept at the back of our minds in this matter, namely, the length of time the human race has existed on the earth. There is scientific evidence that man, i.e. intelligent, implement-using, more or less erect-standing man, has been living on the earth for several hundred thousand years; and his forbears, perhaps for more than *one million years.* According to recent authoritative opinion, history based on written records carries us back only between five and six thousand years from the present. What a short time this is, compared to the length of man's existence on the earth!

We can get some idea of how medicine probably began by studying the savage tribes of today—those peoples who still remain in a more or less primitive condition as regards intelligence and culture. There we find medicine closely mingled with superstition and religion. The medicine men are the priests and are in league with the divine (or the devil). The ancient idea that a disease was a devil (or *the* devil) lived down into historical times. Hence one must take a *bitter* medicine to drive the devil out. The bitterer the medicine the sooner would the unwelcome intruder leave the human body (Fig. 4).

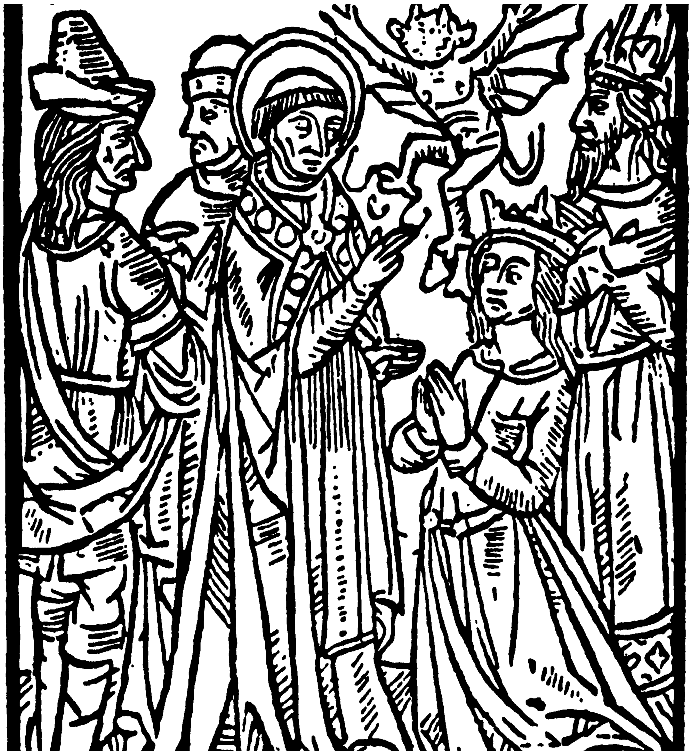

Fig. 4. "St. Mathurin delivering the daughter of Emperor Maximilian of a disease in the form of a demon." (From a life of St. Mathurin published in 1489.) Copied from Haggard, Howard W. *The Doctor in History*. New Haven, Yale Univ. Press, 1934. (10,699)

As Schmidt says,* "The use of drugs is very ancient. With primitive man the observation of plants serving for food led gradually to [the discovery of] some that were good for healing diseases." It is common knowledge that some of our domestic animals, in time of sickness and bodily distress, often seek out certain plants which their instinct tells them will help them to get over their trouble—e.g. catnip (*Nepeta cataria*).

*Coffee an Interesting Example of Drug Plant.* The history of the use of coffee as a beverage and also as a drug is an interesting example of how the use of plants as food may lead to their use as drugs. One story given by Ukers † is substantially as follows: An Arabian goatherd noticed that his flock was unusually frisky, and believing that their mood was due to the effect of some fruits of a plant (the coffee plant) that they had been eating, tried the effect on himself. He became refreshed and gay and joined his goats in their saltatorial revels. A monk, passing that way and learning the situation, believed that the spirit of Mohammed had guided him there, because here was something that would keep him awake during the long prayers and vigils. He conceived the idea of drying and boiling the fruits and thus gave coffee to the world.

Gradually coffee has come into use by physicians as a cerebral stimulant; and the layman, knowing from experience its bracing effect, uses it almost universally, in the United States, in order to "start the day right." Some physicians (in cases where the heart is strong) prescribe a cup of black coffee, taken on an empty stomach, to relieve continued nausea. Here it seems to act also as a general stimulant.

*Some Definitions and Derivations.* According to Schmidt the word drug is derived probably from the Arabic *dowâ,* which means medicine, whence it was transferred, as *doga* or *droga,* into the Romance and later into the Germanic languages. But LaWall ‡ states that the word "is probably of Teutonic origin, the root word

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* Schmidt, Alfred. Drogen und Drogenhandel im Altertum. Leipsic. 1927, p. 1.

† Ukers, William H. All about Coffee. Ed. II, p. 10, New York. The Tea and Coffee Trade Journal Co. 1935.

‡ LaWall, Charles. The curious lore of drugs and medicines (Four thousand years of pharmacy), pp. 355, 356. Garden City Publishing Co. 1927.

'drogue' signifying 'a dry herb.'" Webster's Dictionary (2nd edition, 1943) explains that the "Low German *droge vate* refers to dry casks, goods in packing cases, in which '*droge*' was wrongly taken to mean their contents." The word would seem to be related to the German *trocken,* meaning dry. According to Hatzfeld and Darmesteter's *Dictionnaire* of the French language, the word *drogue* dates from the 14th century. Its source from the Dutch word *droog* (any dry thing) is, according to Hatzfeld and Darmesteter, doubted by some etymologists.

The word druggist, as applied to a seller of drugs, was not commonly used until about the 16th century. In England there are no "drug stores." The "chemist's shop" is the drug store. In France it is the *pharmacie,* or *apothicairerie.* The title *droguiste* is used there for a seller of dried herbs only.

It is worth noting that the word "drug" often connotes a poisonous substance, as in the following, from *Macbeth,* ii—2:

> The doors are open: and the surfeited grooms
> Do mock their charge with snores: I have drugged their possets.

This is evidently because some drugs are strong poisons, as, for example, strychnine, aconite, morphine, cocaine. However, there are many others which are mild and pleasant, and have no poisonous qualities, e.g. licorice, rosemary, lavender, sassafras. Some of these are valuable drugs, because their pleasant odor or taste is used in prescriptions to mask the disagreeable taste of other drugs. The layman would not think of calling rose petals a drug, and yet rose water, distilled from the fresh flowers of *Rosa centifolia,* is well recognized in medicine as a pleasant vehicle, masking the flavor and odor of unpleasant drugs.

The Greek word for drug is *pharmakon.* Hence we have pharmacist and pharmacy (i.e. the art of preparing medicines; also, a drug store); pharmacognosy (from *pharmakon* + *gnosis,* knowing), the science of the recognition of drugs; pharmaceutic or pharmaceutical (meaning pertaining to pharmacy, from the Greek *pharmakeus* or *pharmakeutes,* druggist), and pharmacopoeia (Greek *pharmakon* + *poiein,* to make), a book, generally authoritative, containing a collection of recipes or formulas for the preparation of medicines.

## A SHORT RESUMÉ OF THE HISTORY OF PHARMACY

The progress of pharmacy during recorded history is, like the history of religion, philosophy, sociology, etc., interwoven with the history of the human race itself, especially with developments in the field of science; and thus very closely parallels the development and progress of civilization. In the space here available we can only "touch the high spots" in the history of pharmacy.

Pharmacy, as well as the art and profession of medicine itself, was practised by the ancient Egyptians; the ancient Babylonians and Assyrians probably also had developed a specialized practice of pharmacy.

*The Ebers Papyrus.* One of the oldest and most important documents in pharmaceutical history is the Ebers papyrus, about 1550 B.C., said to have been found between the knees of a mummy in the ancient city of Luxor, the city of the dead, across the Nile, over against ancient Thebes. Other papyri antedate this somewhat, but they do not contain such a large amount of information. Several medical prescriptions now in the British Museum are said to date from the time of Cheops, about 3700 B.C. The key to the translation of the Ebers papyrus was furnished by the Rosetta Stone, an ancient slab of basalt, found in the early part of the 19th century at Rosetta on the Nile delta. The writing on this stone was in 3 sets of characters, one being the Greek, another the writing of the common people (demotic) and the third the hieroglyphics or picture writing used by the priests. The Ebers papyrus was found to include among other material more than 700 prescriptions in which drugs of many sorts are mentioned, such as vinegar, turpentine, figs, castor oil, myrrh, frankincense, wormwood, aloes, opium, cumin, peppermint, cassia, caraway, coriander, anise, fennel, saffron, lotus flowers, linseed, juniper berries, henbane, mandragora, poppy, gentian, colchicum, squill, cedar, elderberries, honey, grapes, onion, and date blossoms. Pharmacy in other ancient countries and civilizations—in China, Japan, India, Persia, and among the Aztecs and Incas of America—if we can judge from the evidence at hand, goes back to forgotten ages.

*The Greek-Alexandrian Period.* The early history of Greek pharmacy and medicine is rooted in Greek mythology. Aesculapius, whose name has been immortalized by botanists in *Asclepias,* the botanical name of the milkweed, was the son of Apollo, and a pupil of Chiron, who has been called the first teacher of pharmacy.

> "Then sucked the blood and sovereign balm infused
> Which Chiron gave, and Aesculapius used."
> Homer's *Iliad*

Aesculapius carried his powers of healing so far as to raise the dead to life, thus incurring the displeasure of Jove, who finished him off with a thunderbolt. But Aesculapius is said to have had a large family, among whom were Hygeia, representing health, and Panacea, representing medicine.

Hippocrates, born on the island of Cos, 460 B.C., is generally conceded to be the father of Greek medicine. One of his principal contributions was to divorce medicine from the superstition which had enveloped it up to that time. Even in his day, medicine was divided into 3 schools: 1. based on the action of medicine; 2. based on diet; and 3. on physical manipulations. Hippocrates was a keen observer, an accurate thinker, and a clear and concise writer. One of his wise sayings was, "Life is short, opportunity fleeting, judgment difficult, treatment easy, but treatment after thought is proper and profitable."

Aristotle, born in 384 B.C., a pupil of Plato (390 B.C.) and one of the most notable figures in ancient Greek philosophy, was a great student of natural science. His work and conclusions had a profound influence on the scientific world and his ideas on evolution were about 2000 years ahead of his time. Theophrastus (390–280 B.C.) was a disciple of Aristotle, and, if for no other reason, should be mentioned here because of his work in botany. In fact, he is generally known as the "Father of Botany." Theophrastus's "Enquiry into Plants," in 9 books or sections, is a wonderful work, considering the period in which it was written, and is of importance chiefly because it contains a record of the knowledge gained up to that time, of plants and plant life. It discusses, among other things, morphology, physiology, ecology, horticulture, although not necessarily under those names, and includes woods and their uses, medicine, and various superstitions.

Sir Arthur Hort's English translation, published in 1916, makes very interesting reading.

*The Rhizotomoi.* In ancient Greece there was a special guild of men called *Rhizotomoi,* literally *root cutters,* whose business was to gather, prepare and sell the roots of medicinal plants. The botanists of ancient times, such as Theophrastus and Dioscorides, "do not conclude a description [of a plant] without telling us what the subterranean parts are like, whether fibrous or fleshy or tuberous or bulbous, as well as the properties of them," i.e. their virtues or medicinal value.* Why this particular attention to roots? It is common knowledge that not only the roots but also the rhizomes or underground stems, and the tubers of many plants serve as repositories for the plant's reserve food. Now, along with this food storage there seems to be deposited in these underground parts a large amount of certain organic substances or compounds characteristic of the plant species. For example, roots of sassafras and licorice yield the particular organic substances characteristic of those plants in greatest amount, although these substances also occur in lesser degree in other parts of the plant. This concentration in the root of important organic substances was recognized early in man's history. Hence the formation of the guild of *Rhizotomoi* (Fig. 5).

The royal Ptolemies of Alexandria (307–221 B.C.) did much to further the cause of medicine. For one thing, they encouraged the dissection of the human body, hitherto forbidden by law. Thus the bodies of condemned criminals were handed over to "surgeons," and much was learned about the location and appearance of the internal organs. Unfortunately, however, their functions were not yet understood.

With the annexation of Alexandria to the Roman Empire (30 B.C.) the Greek-Alexandrian period may be said to have ended, although, as we shall see, Alexandria continued to exert an influence on the Roman period which followed. During this Greek-Alexandrian period the most notable advances were the gradual throwing off of the shackles of superstition and, through dissection, the beginning of a real knowledge of the organs of the human body.

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* Greene, Edward Lee. Landmarks of botanical history. Part 1, p. 45. Smithsonian Miscellaneous Collections. Part of Vol. 54. 1909.

*Roman Period.* While the Romans were expert in political organization and in the arts of writing and speaking, scientific progress in medicine during the Roman period was about nil. This was the time of Galen (Claudius Galenus, 130 A.D.), another Alexandrian whose ideas about medicine were accepted for many hundreds of years. In fact, as late as 1560 a certain "Dr. Geynes was not admitted to the College of Physicians and Surgeons in

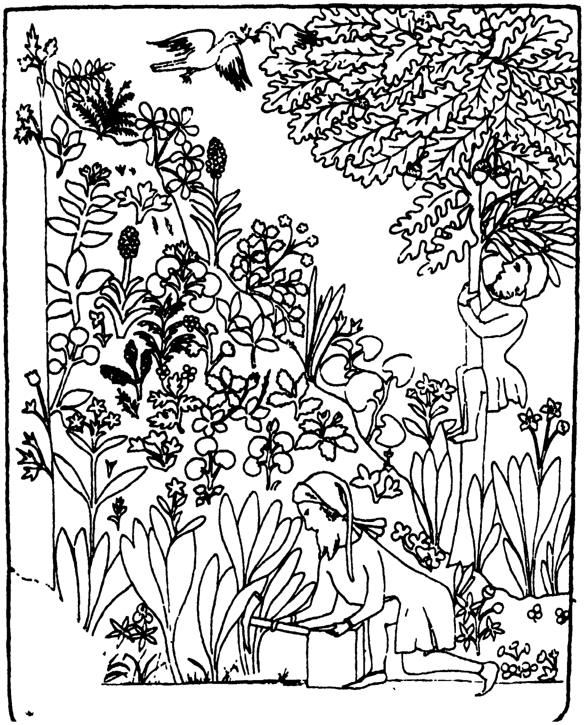

FIG. 5. A herbalist is climbing an oak to gather mistletoe. A rhizotomist is digging up roots. From a drawing traced from a facsimile on Plate XXII of the Atlas to Giacosa's *Magistri Salernatani,* Turin, 1901. The 15th century Saroyan Ms., from which the drawing was traced, has since perished. Reproduced from Charles Singer, *Studies in the History and Method of Science,* Vol. II, p. 59. (10,106)

London until he had signed a recantation of his error in having impugned the infallibility of Galen." Human dissection being again forbidden, Galen had to form his opinions by dissecting animals. One of his ideas was that health and disease are dependent upon the relative proportions of solids and liquids in the body.

During this period the use of special earths or clays for pharmaceutical purposes became popular. One of these was obtained from a pit in the island of Lemnos, which could be opened only on a certain hour of a special day of the year, and then only to the accompaniment of certain religious rites. Other earths or clays came from Malta, Portugal, and Hungary. Clays are still official in the U. S. Pharmacopoeia, their value being due to their agglutinating effect on bacteria, which are attracted and adsorbed. Incidentally, the subject of cosmetics may properly be classified as a branch of pharmacy, and a branch of very great economic importance if we are to judge by the amount of money received from the public.

Toward the end of the 5th century (476 A.D.) Rome fell completely into the hands of the Germanic hordes—invading Gothic tribes from the north and east—and there ensued a long period, lasting nearly 1000 years, of general intellectual darkness and stagnation, which is called the Medieval Period, or Middle Ages.

*The Middle Ages.* It is chiefly to the Arabs that we are indebted for any advance in pharmacy and medicine during the early part of the medieval period. The Arabians were largely responsible for the development of alchemy, i.e. the search for a method of transmuting the baser metals into gold. It included also a search for an elixir of life and for a universal medicine—one which would cure any or all diseases. Investigations of this sort, to which some notable figures, such as Lully (1235–1315), devoted a large share of their lives, were chiefly of value because through them progress was made in chemistry.

"The Arabian pharmacists were called '*sandalini*'; their stocks were regularly inspected and punishment was meted to those who were found guilty of selling spurious and deteriorated drugs. The effect of Arabian chemistry and pharmacy was felt for hundreds of years and influenced and stimulated the production of many pharmacopoeias of the Middle Ages." (LaWall, p. 114.)

The part played by the monasteries during this period was important. For one thing, the translation and in particular the copying by the monks of manuscripts was the only way to increase the number of copies of books, printing being not yet invented. Also, the monastic gardens served to keep alive the herbs and simples used in medicine and pharmacy and also the knowledge of their "virtues." Probably these same gardens were the sources of many of the botanical specimens figured and described in the wonderful herbals of the 16th and 17th centuries.

In the eleventh and twelfth centuries there was a gradual intellectual awakening—a foreshadowing of the Renaissance. An important factor in this awakening was doubtless the founding of great universities—Paris, 1110; Bologna, 1113; Oxford, 1167; Cambridge, 1209; Padua, 1222; and Naples, 1224. In all these universities pharmacy was taught as a part of the course in medicine.

Noteworthy in the history of pharmacy was the edict of Frederic II of Sicily (1224) which regulated both the practice of medicine as well as that of pharmacy. It refers to the *apotheca* as a warehouse where drugs were stored (the term "apothecary" came into use at about this time), to the compounder of drugs as the *confectionarius,* reviving an old Roman term, and to the seller of drugs as the *stationarius.* There must be no collusion (it said) between physician and pharmacist, i.e., no sharing of profits from medicine prescribed by the former. Any inspector conniving at a violation of the law was punished by death.

Following is one of the recommendations of that period for the behavior of the physician when in the bosom of the family.

"When entertained by the family, his remarks at the table are to be punctuated by continued inquiries regarding the patient, whose condition he should always regard as grave in order that either a favorable or a fatal termination of the illness might redound to his credit. He should not impair his professional standing by flirting with his patient's wife, his daughter, or his maid servants."

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FIG. 6. A Pharmacy of the 15th Century, with three "savants," sitting, and two attendants on either side. At the table in the rear an apprentice is pounding herbs with mortar and pestle. (After *Gart der Gesundheit,* Schönsperger, Augsburg, 1486. From Arnold C. Klebs, *A catalog of early herbals.* L'Art Ancien, 1925.) (10,637)

*The Renaissance,* of the 14th and 15th centuries, as is generally known, marks the transition between the Middle Ages and modern history. Its beginning and duration (from about the Fall of Constantinople in 1452, to the Sack of Rome, in 1527) vary more or less with art, philosophy, science, and other branches of culture and learning. It was characterized by the "Revival of Learning," the rediscovery of the Greek and Latin classics, and the development of "Humanism."

Pharmacy and medicine, originally practiced by the same persons, became well recognized during the Renaissance as separate professions, and were looked upon with increasing respect, one reason being that they were in demand because of the prevalence of epidemic diseases at this time. Leprosy, ergotism (caused by eating rye bread in which the rye had been infected with the ergot fungus), and black death or oriental plague were common. It is recorded that there were 200 lazar houses (pesthouses) in Great Britain and over 2000 in France. The black death was responsible for the loss of 25% of the human race in the 13th and 14th centuries—an estimated total of 60 million people.

The works of Chaucer (1340–1400), in which he takes several "cracks" at the physician and apothecary, reflect an intimate acquaintance with their callings. In his *Canterbury Tales* he says of the physician, "His studie was but litel on the Bible," and,

"He kepte that he wan in pestilence,
For gold in physik is a cordial,
Therfore he lovede gold in special."

During the 14th and 15th centuries the search for the philosopher's stone and the elixir of life went on fast and furiously, as the lives of Alain of Lisle, Ferarius, Flamel, Peter Bono, Basil Valentine, Bernard Trevisan, and others emphatically attest.

An innovation of tremendous importance, profoundly affecting every branch of learning, dates from about 1450, namely, the invention of printing by the use of movable type. By means of this invention, knowledge could be far more easily disseminated, for it must be remembered that up to that time all books had to be written by hand.

The discovery of America by Columbus, in 1492, is related in a rather direct way to medicine, for many drugs and spices were expensive and hard to get because they were brought overland by caravan from the east, or long distances through pirate-infested waters. Hence Columbus's quest for an easier route to India by sailing west.

*Sixteenth, Seventeenth, and Eighteenth Centuries.* The works of Shakespeare (1564–1616) give evidence of an intimate knowledge of drugs and simples. During this period several famous botanic gardens were founded; Pisa, 1543; Padua, 1545; Florence, 1545; Bolonga, 1567; Montpellier, 1593; Paris, 1635; Edinburgh, 1670; and Chelsea, 1673. Several herbals, now classics, appeared: e.g. Brunfels, 1530; Fuchs, 1542; Matthioli, 1544; Gerarde, 1597; Parkinson's *Paradisi in Sole, Paradisus Terrestris,*[1] 1629. These were ponderous tomes which contained (usually) wood cuts of the common plants known at that time, botanical descriptions of them, and accounts of their "virtues" or uses.

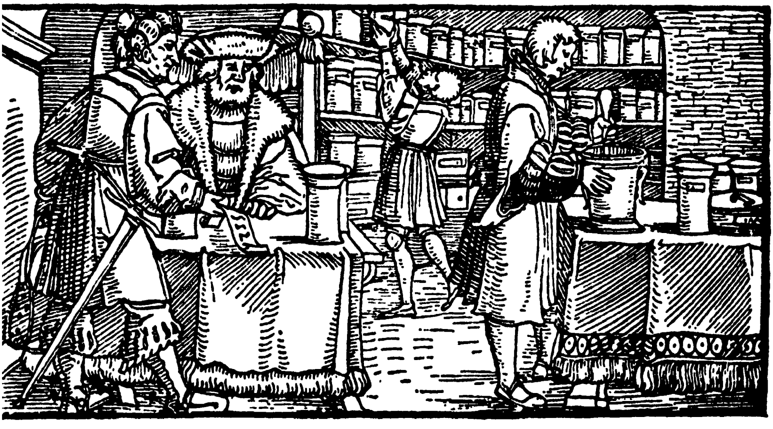

FIG. 7. A "Drug store," about 1536 A.D. From *Pictorial history of ancient pharmacy*, by Hermann Peters. English translation by William Netter. Chicago, 1889. (10,604)

*Some Superstitious Beliefs.* We have said that in the beginning pharmacy and medicine were intermingled with religion and superstition. Since the time of Hippocrates, physicians, pharmacists, and scientists endowed with independence and logic like his, have striven to rid the human race of the superstitions that encompass the whole art and practice of medicine. Even now these superstitions have not been wholly eliminated. Does not your friend "touch wood" when he says he has "not had a cold for months"? Much of the advertising of nostrums depends for its success, if not on superstition, at least on credulity.

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[1] The words *"Paradisi in Sole"* are a Latin pun of the author on his own name—"Park-in-son."

In the 16th century the old "Doctrine of Signatures" which is said to be of very ancient Chinese origin, still flourished, being brought into prominence by Paracelsus (1493–1541). The idea was based on the belief that the Creator, or some supernatural power, seeks to show to mankind, by the resemblance of a plant or a plant part to an organ of the human body, that that plant or plant part is intended to be used as a remedy for a disease of the organ it resembles. Thus, a pomegranate fruit, when opened up, has seeds which might be said to resemble loose teeth. Hence it should be used for dental troubles. The hepatica or liverleaf, having a leaf said to resemble a human liver, should be taken in some way,—infusion, tincture, etc.—for hepatic diseases. The doctrine was extended to include plants that resembled poisonous animals. Thus, a plant with a spotted stem or leaf like that of a poisonous snake would be a good antidote for a bite of that snake. Minerals were also included—thus, mercuric sulfide or cinnebar, of a blood red color, would be excellent for troubles of the blood.

The superstitions associated with the mandrake are reminiscent of the ancient "Rhizotomoi," and remind one of the doctrine of signatures. The European mandrake is *Mandragora officinarum*, an herb of the potato family, and indigenous in southern Europe and northern Africa. It has a long, thick, sometimes forked root and was supposed, when uprooted, to resemble, altogether, the human form—in fact there were said to be male and female plants. The root was accredited with great healing powers and a very special manner of digging it up was advised, somewhat as follows: * the digging must be done at night when the plant "shines like a lamp." Then, as soon as one sees it, he must strike it on the head with an iron lest it escape; then dig around it with an ivory implement, without touching it. Pulling it from the ground was fraught with great danger to the puller; therefore, the upper part should be tied to a dog which was then coaxed away, thus uprooting the mandrake (Fig. 8).

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* Arber, Agnes. Herbals, their origin and evolution. pp. 36, 37. Cambridge, England. 1912.

Simon Forman, a member of Magdalen College, wrote of the mandrake, in 1603, "Also I have knowen the old saying prove true, that whosoever diggith up a mandrake shall die within a yeare, and som have said they have heard them cri or shrike when they have been pulled up. . . ." *

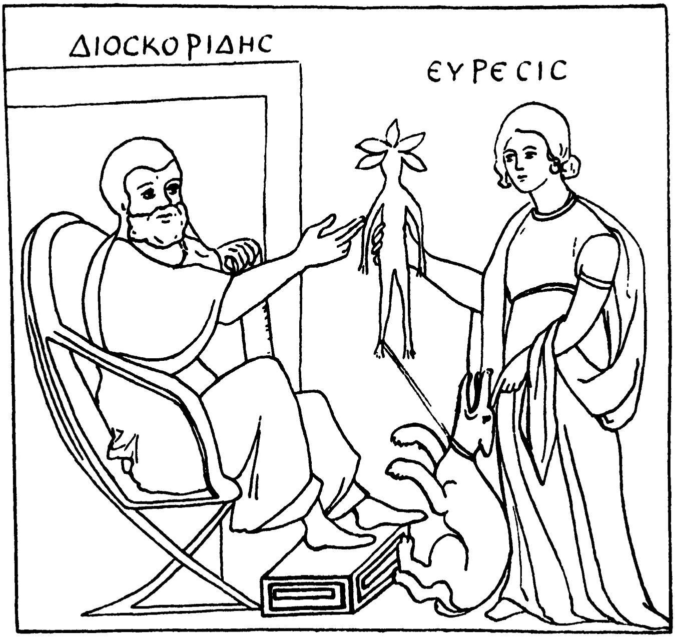

Fig. 8. A mandrake (Mandragora) being presented by Discovery (Euresis) to the physician Dioscorides. The plant is still tied to the dog whose life was sacrificed in order to get the root. From Julia Anicia Ms., about A.D. 512. Reproduced from Charles Singer, Studies in history and method of science. Vol. II, p. 62. (10,631)

Our American mandrake is quite another plant—*Podophyllum peltatum,* of the Barberry Family (*Berberidaceae*), commonly known as the May apple. It is interesting to note that the European mandrake is not now in the U. S. Pharmacopoeia, but the rootstock of the American mandrake yields an important drug, *podophyllin,* in the form of a poisonous, resinous substance, called *Resina Podophylli,* employed as a cathartic.

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* Gunther, Robert T. The herbal of Apuleius Barbarus from the early twelfth-century manuscript formerly in the abbey of Bury St. Edmunds. Oxford. 1925.

Porta's *Phytognomonica,* a learned exposition, in Latin, of the doctrine of signatures with interesting and clear wood cuts of the plants, and nearby, the bodily members they resembled, was published in 1589. Among the illustrations is one of a youth with a luxuriant head of hair, and above, a hair-cap moss with its thick crop of hair-like stems, with recommendations for its use in cases of alopecia. But it is significant that a likeness of the author, presumably, appears on the frontispiece, and it is quite evident that he has hardly a spear of hair on his head! Hair of the hare, swine, cattle, or other hairy beasts was also recommended for curing baldness, for animals too had a place in this fantastic doctrine.

Another curious superstition was the idea of a sympathetic remedy. This was the notion that in the case of a wound the remedy was to be applied not to the wound itself but to the object that caused the wound. The wound was bandaged, it is true; but the axe, knife, or other instrument responsible for the cut was treated with salve or some curative ointment. Somewhat as we say to our little children, when they run against a post or are thrown from their sled, "Naughty post! Naughty sled!" etc. Paracelsus, who popularized the sympathetic remedy, believed "that the anointment of the weapon acted upon the wound by a magnetic current through the air."

A superstition, persisting to the present time in some parts of the country, was that if one is poisoned by a plant, for example poison ivy, another plant (in this case, Touch-me-not (*Impatiens*) or *Lobelia*), a remedy for the poison, will be found growing in close proximity to the poisonous plant; docks will be found growing near stinging nettles (*Urtica dioica*) for the poison of which they are said to be a cure.

With the beginning of the colonization of America (Jamestown, 1607; Plymouth, 1620) the practice of medicine and pharmacy commenced in this country. "There were some fine educated physicians and apothecaries in each of these settlements, but for the most part the practice of medicine consisted of empiricism and the following of Indian folk lore. No encouragement or recognition of professional or other education was given by any of these local colonies. . . . In the colonies under Spanish and French influence, the priests, and particularly the Jesuits, were the most important factor in the development of pharmacy and medicine."

One authority says of this period, "Anyone who knew calomel from tartar emetic, and jalap from ipecac, and had the assurance to use them, who could make and apply ointments and plasters, dress wounds or splint a broken limb, was a welcome settler and received the title of Doctor without asking."

In 1765 the first medical school in the United States was established at the University of Pennsylvania, and pharmacy was taught there, prescription writing being thus introduced into the United States. It was here that Adam Kuhn, a pupil of Linnaeus, became, in 1768, the first professor of materia medica and botany in the United States (Fig. 9). In 1790 the first medical journal was published, in New York.

FIG. 9. Adam Kuhn, the first professor of botany and *materia medica* in America, at the University of Pennsylvania. From Kelly, Howard A. *Some American medical botanists.* Troy, 1914. (4026)

*Nineteenth and Twentieth Centuries.* The inventions, discoveries, improvements, and new methods of this latest period are far too many even to enumerate here. By means of the improved compound microscope, the nature of protoplasm, that is, the living matter of the cells of plants and animals, was demonstrated during the first half of the nineteenth century by Von Mohl, Schleiden, and Max Schulze; and Pasteur (1822–1895) laid the foundations of the science of bacteriology by his work with the *bacteria*—which include plants of the greatest importance in medicine. In this case, however, these plants were shown to be usually the cause rather than the cure, of disease.

The present century has already witnessed a great increase in our knowledge of the nature and etiology of disease as well as of curative agents, including the use of serums and antitoxins, and the introduction of substitutes for remedies derived from plants, such, for example, as *atabrine* for *quinine*. Ephedrine (Ma Huang), an alkaloid derived from the Chinese plant, *Ephedra equisetina* and other species, has also come into general use following the studies of Dr. K. K. Chen and associates at the Peking Union Medical College in 1924.

In all this mixture of fact and fancy, of superstition and good sense, of pushing forward and sliding back, by the method of trial and error, one thing emerges crystal clear. Looking down the perspective of all these centuries of record, and before, there *has* been a definite and sustained progress toward more, and more accurate, knowledge, and greater efficiency. Moreover, it seems to be a constantly accelerated progress, that is, faster and faster with each passing year. Obviously, man is still struggling. But if we are to judge by the past, he will some day come through to a clear understanding and perfect knowledge.

# MEDICINAL USES OF DRUG PLANTS CULTIVATED IN THE MEDICINAL PLANT GARDEN OF THE BROOKLYN BOTANIC GARDEN

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Many of the vegetable drugs used in medicine are included in the United States Pharmacopoeia and National Formulary, both of which references contain extensive descriptions of the part of the plant used medicinally together with the legal standards of purity and potency. The abbreviations U.S.P. and N.F. appearing after the several names of a drug plant indicate its recognition and inclusion in these official books of drug standards. The abbreviation N.O. indicates a drug plant which has no official recognition in these books.

ACONITE (*Aconitum napellus*), Monkshood, U.S.P. The poisonous nature of this plant has been known since the earliest times and certain species native to China and India have long been in use for medicinal purposes in those countries. Present supplies are imported from the mountainous regions of Spain, France, Germany and Austria, although owing to present conditions the Indian aconites are appearing upon the market. The active constituents are extremely poisonous alkaloids. The tuberous root is recognized in the official compendia of nearly all countries. The drug is administered internally and with caution as a heart sedative. Externally applied, usually in liniment form, it is anodyne. On the whole, aconite is not used extensively in medicine today. Many dentists use aconite plus iodine for painting the gums to numb the nerve endings before a hypodermic injection of procaine. Probably 20 to 30 acres of the proper cultivation of the Sparks variety, yielding 500 lbs. per acre, would supply U. S. needs. Aconitum varieties vary in toxicity. Toxicity also varies with the chromosome number. Diploids are non-toxic usually. Triploids and tetraploids are extremely toxic. (See Bonisteel, Wm. J. Jour. Am. Pharm. Assoc. Sci. ed. 29, No. 9, Sept. 1940.)

FIG. 10. Herb Garden of Brooklyn Botanic Garden. View facing west. Knot gardens of Sweet Violet (*Viola odorata*), Lavender Cotton (*Santolina*), Germander (*Teucrium Chamaedrys*), and Thyme (*Thymus vulgaris*), surrounded by medicinal and culinary plants. Cf. Fig. 1. (10,317)

ALKANET (*Anchusa officinalis*), Dyer's bugloss, N.O. The alkanna plant is a perennial herb of southwestern Europe and adjacent Asia. Before the days of coal-tar dyes, it was very largely cultivated as a dyestuff. It is rarely employed for any other purpose than imparting a red color to medicinal and cosmetic preparations.

ALOE (*Aloe vera*), Aloes or Bitter aloes, U.S.P. The Pharmacopoeia recognizes several species of aloe as sources of medicinal aloes. The article used in medicine is the juice obtained from the cut surfaces of the leaves, thickened by evaporation. The biblical aloes used as a perfume material and in incense was probably the wood of *Aquillaria agollocha* and not related to the medicinal aloes of today. The dried juice prepared commercially is often a composite of the juices of separate species. The U. S. imported 801,300 lbs. in 1940. It was valued at $238,904. Aloe is the source of aloin and the juice has laxative properties. The yield of aloe juice increases with age up to four years and then declines for ten or more years. A one year old plantation produces 100 lbs. of prepared aloes per acre in comparison with 500 to 1000 lbs. per acre from a four year old acreage. Fresh leaves have been used very recently in the treatment of burns and are reported as being particularly effective in alleviating burns resulting from an overexposure to X-ray.

ALTHEA (*Althea officinalis*), Marshmallow root, U.S.P. The peeled root deprived of rootlets has long been used in domestic medicine. Owing to the large amount of gum and starch present it is demulcent. The powdered root is used in the preparation of marshmallow candy.

ANGELICA (*Angelica Archangelica*) N.O. This plant is a native of northern Europe where it exists as a tall perennial and is extensively cultivated for the fruit and root. It is highly valued as a domestic drug and condiment by the natives of Lapland where it is indigenous. The infusion is used medicinally as a carminative and expectorant.

ANISE (*Pimpinella Anisum*), Aniseed, N.F. The dry seedlike fruit is obtained from a perennial herb native to Egypt and Greece, now cultivated throughout the Mediterranean region, particularly in Spain. Long a popular herb and remedy of the Middle Ages, it is much used to the present day. The carminative and corrective properties are due to the volatile oil.

BITTERSWEET (*Solanum Dulcamara*) N.O. A soft woody climbing or reclining plant of Europe and North America growing along the borders of streams. The stem of the plant has been used as a laxative, especially in rheumatism, and as an alterative in certain skin diseases.

BOUNCING BET (*Saponaria officinalis*), Soapwort, N.O. Saponaria is widely distributed in Europe and the United States, growing by roadsides and in waste places, flowering in July and August. The parts used medicinally are the roots and leaves, which contain the glucoside, saponin. In water the dried plant produces a foam or frothing similar to soapsuds and is much used as a detergent. It is also used as a tonic diaphoretic and alterative in the form of a decoction or tea.

BOXWOOD (*Buxus sempervirens*) N.O. A small, dense-leaved, hardwooded evergreen tree, native of dry, chalky hills in Europe and western Asia. The bark has been used as an adulterant of pomegranate and has the same medicinal properties, although to a lesser degree. It is a taenicide (vermifuge), astringent.

BROOM (*Cytisus scoparius*), Broom tops, N.O. The plant is a tall, gregarious, densely branching shrub, growing in Europe and introduced into this country. It has been used from antiquity in the treatment of dropsy, and is mentioned in the earliest Italian and German herbals. It has been used as a diuretic in certain cardiac disorders.

BRYONY (*Bryonia dioica*) N.F. The cucumber-like vines of this plant abound in central and southern Europe. The turnip shaped root is cut into slices and dried, and its medicinal virtues were well known to the ancients. It is used as a cathartic and diuretic to some extent in modern medicine.

BUCKTHORN BARK (*Rhamnus Frangula*), Alder buckthorn, N.F. Grows as a large shrub or small tree throughout Europe, Siberian Asia and the northern African coast. It is used for the same purposes on the continent as Cascara Sagrada bark is used in this country. It is a remedy for chronic constipation, but is more irritant than Cascara and apt to cause griping. It has also been used as a dye for cotton, silk, and wool fabrics.

BUTTERFLY WEED (*Asclepias tuberosa*), Pleurisy root, N.O. Asclepias is a perennial plant, common and abundant in sandy soil in the eastern and central United States. The root was one of the favorite remedies of the North American Indians, being used as an expectorant, diaphoretic, and emetic. Thoroughly cooked it was also used as a food. It is now chiefly used as a diaphoretic and diuretic. The root, however, contains two glucosides,—asclepiadin, an emetic; and asclepin, a mild sedative derived from asclepiadin. Milkweed floss is used in life-belts and floats to replace the now non-procurable kapok which was formerly imported from the Far East in amounts of 10,000 tons per annum. The U. S. government has taken every pound that can be supplied. Butterfly Weed floss is so similar to kapok that, in the New York area, several dealers have been fined for substitution.

BUTTERNUT BARK (*Juglans cinerea*) N.O. The butternut is a good-sized tree of eastern and central North America. The inner bark of the root was used medicinally by the aborigines as a mild cathartic. Owing to its tannic content it was used in the treatment of dysentery and diarrhea by the soldiers during the Civil War. The kernel of the nut is oily, pleasantly flavored, and edible.

CALAMUS (*Acorus Calamus*), Sweet flag, N.F. The calamus of the scriptures is probably identical with this article, the market form of which is the peeled, dried rhizome freed from roots. A marsh plant probably originating in India and Central Asia, it has spread to all parts of the globe. Because of its volatile oil it has a limited use in medicine as a carminative in colic and stomach disorders.

CARAWAY (*Carum carvi*) U.S.P. The caraway plant is a low biennial herb, native of western Asia and Europe and now widely cultivated. The use of this plant as a spice and condiment extends back to the XII Century, yet it was among the last of the umbelliferous fruits to be introduced into western Europe. The volatile oil is responsible for its carminative and stimulant properties.

CARDAMON, ROUND (*Amomum Cardamomum*) N.O. A tall perennial herb growing in the East Indies and in Siam. The seeds resemble those of Malabar cardamon (*Elettaria Cardamomum*), but with a more strongly aromatic, camphoraceous taste. They are often substituted for the official seed and are considerably used in Europe as a carminative and condiment.

CASCARA SAGRADA (*Rhamnus Purshiana*) U.S.P. Found in the mountain ranges of the Pacific States and in southwestern Canada. The bark is stripped from the tree and aged for one year before use. The ageing process reduces the griping and irritation oftentimes produced by the green bark. Cascara is one of the best tonic laxatives and is so employed in every civilized country.

CASTOR BEAN (*Ricinus communis*) N.O. This large herbaceous annual is a native of tropical Asia where it attains the size of a tree. The seeds are bean like and very attractive in appearance, no two being exactly alike in markings. Although the crude drug is not official, the oil (*Oleum Ricini*) is U.S.P. The castor oil of medicine and industry is obtained by expression of the seeds, the cold pressed oil being superior in quality and taste to the hot pressed article. Nevertheless it is quite unpalatable, very heavy and viscid, and generally difficult to administer. It is a prompt and efficient cathartic. The coats of the seed contain a deadly poison.

CATNIP (*Nepeta Cataria*), Catmint, N.F. Catnip is a tall perennial herb of Europe and Asia, now thoroughly naturalized in the United States. The leaves and top are medicinal and have a strong characteristic odor. The infusion is used as a carminative for infants, and also as an aromatic bitter.

CHAMOMILE (*Anthemis nobilis*), Roman chamomile, N.O. This plant has been cultivated for centuries in Europe, especially in England, and has been long used in domestic medicine. It is one of the best of the aromatic bitters and stomachics, similar to Matricaria in this respect. The dried flowers of this species of Anthemis, decorative with its finely divided leaves, are employed to brew an aromatic tea which is reputed to quiet the nerves. It is served "piping hot" to patrons in some of the exclusive Beauty Shops of New York City.

CHAMOMILE, WILD (*Matricaria Chamomilla*) N.F. The flower heads of this perennial European weed have been used in decoction form as a domestic remedy to abort colds since antiquity. It is one of the mildest aromatic bitters and is given in rather large doses. In very large doses it is used as an anthelmintic and may be emetic or cathartic.

CLOVER, RED (*Trifolium pratense*) N.F. The crude drug consists of the dried inflorescences of this common plant of our waysides and meadows. It is prepared as an infusion for use as an alterative to improve gradually the nutritive processes of the body. It has been reported to be beneficial in whooping cough. Dried red clover flowers are also employed separately and in combination with other ingredients in the brewing of beverage teas. Such beverages have a local consumption throughout the United States. Red Clover Tea can be purchased on the New York market.

CLOVER, YELLOW SWEET (*Melilotus officinalis*), Yellow melilot, N.O. Melilot is a perennial herb, native of Europe and closely related to *M. alba*, a white flowered species. The whole plant is scented because of the presence of the aromatic coumarin. Its use is chiefly external as an emollient in combination with other herbs.

COHOSH, BLACK (*Cimicifuga racemosa*), Black snakeroot, N.F. Cimicifuga is native to eastern and central North America, especially abundant in the Allegheny region. The plant was highly valued by the Indians, who introduced the drug to the early American medical practitioners. The natives used it especially for the treatment of rheumatism. It is also of some use as an anodyne, being similar to aconite in this action.

CORIANDER (*Coriandrum sativum*) N.F. Coriander is a low annual, native of southern Asia and extensively cultivated in all the warmer portions of Europe. Its small seed-like fruits were used by the Romans as a medicine and spice in very early days. The fresh plant when bruised emits a very unpleasant odor, but the fruit on drying acquires a very pleasant aromatic odor due to the volatile oil present. It is popularly used as a stimulant and carminative.

CORN SILK (*Zea Mays*) N.F. The fresh silk or styles and stigmas of the corn plant has been used in the form of a tea or decoction for acute affections of the bladder. It exerts a diuretic and slightly anodyne action upon the genito-urinary tract.

COSTMARY (*Chrysanthemum Balsamita*) (*Tanacetum balsamitum*) N.O. A southern European perennial which is found to some extent in this country as an escape. The plant has a strong aromatic odor and a bitter taste. It has been used in medicine as a bitter tonic and diaphoretic, being similar to the related herb Tansy. In overdoses it may be extremely irritant.

COTTON (*Gossypium herbaceum*) N.F. The bark of the root of the common cotton plant has been used since the days of American slavery to induce abortion. The hairs of the seed yield the cotton fiber which is used for absorbent and textile purposes. The seeds yield the fixed oil of considerable importance for food and culinary uses as well as in industry. The residue after expression of the fixed oil is the cottonseed oil cake widely utilized as stock feed.

CRAMP BARK, TRUE (*Viburnum Opulus* var. *americanum*), High bush cranberry bark, N.F. A shrub or small tree native in northeastern North America flowering in June and presenting a very showy appearance. Its fruit is an excellent substitute for the Cranberry. The bark is used as an anti-spasmodic, and as a carminative and sedative for intestinal cramp.

CUCUMBER, SQUIRTING (*Ecballium Elaterium*) N.O. This plant is native to Mediterranean regions and its habit is similar to that of the cucumber. The juice of the fruit is the source of the cathartic principle elaterin, perhaps the most drastic of vegetable cathartics and therefore dangerous in use.

DOCK (*Rumex crispus*), Curly dock or yellow dock, N.O. A native of Europe, this plant has become so thoroughly naturalized in the U. S. that it is among the most abundant and pernicious weeds. The leaves were once esteemed as pot herbs, especially in the spring when green foods were not readily obtainable. The dried root of the plant contains much tannin and is used as a mild astringent.

ELDER (*Sambucus canadensis*), American elder, N.F. This plant furnishes the elder flowers used in medicine. The plant is a shrub growing in low damp grounds throughout the country. The stems are filled with a light and porous pith, especially distinct when young. The flowers are white to pale yellow, numerous, occur in large flat-topped cymes and have a heavy odor. The fruit consists of numerous purplish black berries. The flowers are mildly stimulant and act as a diaphoretic and diuretic, and are much used as an ingredient of expectorant teas and similar preparations.

The dried flowers are used separately and in combination with peppermint leaves to brew a pleasing beverage tea.

ELECAMPANE (*Inula Helenium*) N.O. This plant is a tall coarse perennial herb, native of Europe and widely naturalized in the U. S. The root is used in veterinary medicine. In human medication it has been employed for its expectorant, diuretic and diaphoretic properties.

EPHEDRA (*Ephedra equisetina*), Ma Huang, N.O. The shrub yields the alkaloid ephedrine, U.S.P. and is a native of northwestern China and Thibet where it has been used since prehistoric times in the treatment of "disorders of the kidney." It has been introduced into modern medicine in recent years and has proven a valuable remedy in respiratory conditions such as bronchial asthma, hay fever, catarrh, hemorrhage and in ophthalmic practice to produce dilation of the pupil. Ephedrine has valuable utilization as a substitute for adrenalin (epinephrin). It has some advantages over adrenalin in certain instances because it is not limited to hypodermic administration. It is almost as effective orally in pill form as adrenalin is intravenously. In addition, the effect of ephedrine, if given intravenously, is more prolonged although less potent than adrenalin. The crude Ephedra has been imported from the Orient but the Bad Lands of the Dakotas are ecologically adapted to its culture and could supply all U. S. requirements. Economically, synthetic ephedrine can be produced at one-fiftieth of the cost of synthetic adrenalin.

FENNEL (*Foeniculum vulgare*), Fennel seed, N.F. The plant is a tall biennial, native of Europe and Asia but now cultivated in many countries. The leaf stalks are frequently eaten as a relish. The fruit or so-called seed has been used since the earliest times, in preparing an infusion for colic and griping. It is mentioned in the Anglo-Saxon domestic medical recipes of the XI Century, and its cultivation was encouraged by Charlemagne.

FEVERFEW (*Chrysanthemum Parthenium*) N.O. This is a perennial herbaceous plant, native of Europe and common to the United States. It has been used as a tonic, stimulant, and carminative due to its volatile constituents.

FIG (*Ficus carica*) N.O. Native to Persia and Asia Minor, its cultivation has been extended to mild climates of the entire world.

The fruit and its leaves are repeatedly mentioned in the Scriptures, in the Arabian Nights, and in the writings of Pliny. Dried figs were a regular article of trade during the Middle Ages, being used as a food and confection. The chief value of figs beside their laxative action, is as a palatable addition to more active drugs such as Senna and Cascara.

FLAG, BLUE (*Iris versicolor*) N.F. Blue flag is one of our most beautiful and interesting wild flowers, growing throughout the U. S. in wet, marshy localities, blooming in May and June. The plant was highly esteemed by the American Indians who used it in gastric affections. It is sometimes called "vegetable mercury" due to the salivation it produces. The rhizome is used as a cathartic, diuretic, and emetic in conjunction with other drugs.

FLAG, YELLOW (*Iris pseudacorus*) N.O. A European species which is becoming naturalized in the East. The medicinal properties are similar to those of the native *I. versicolor.* q.v.

FLAXSEED (*Linum usitatissimum*), Linseed, U.S.P. The flax-plant, native to Central Asia, is cultivated in all temperate regions for its linen-yielding fiber, as well as the seeds from which one of the most extensively used oils is obtained. The textile uses of flax fibers have been noted in the earliest records of civilization, and Egyptian tombs show paintings of the weaving of flax into cloth. Greek writers of the 7th century B.C. mention flax as a medicine. Charlemagne promoted the growth of flax in northern Europe, and the plant reached Sweden and Norway before the 12th century. The ground seed is used as a poultice and demulcent while the residue after expression of the oil is valuable cattle feed.

FOXGLOVE (*Digitalis purpurea*) U.S.P. Foxglove is a handsome biennial plant, native to central and southern Europe. It has been introduced elsewhere as a garden plant and has escaped from cultivation, particularly in the northern Pacific Coast states. It has been used in cardiac and dropsical conditions since the early days, and at present it is one of the major cardiac tonics and circulatory stimulants in medicinal use.

FRINGE TREE (*Chionanthus virginica*) N.F. This small tree is native to the southeastern United States, blossoming in May and June. It has long been used as a popular hepatic stimulant and tonic laxative. The bark of the root contains the medicinal ingredients.

GINGER (*Zingiber officinale*) U.S.P. The dried peeled or partially peeled rhizome has been a spice and a domestic remedy from the earliest times. The plant is a reed-like perennial probably native to tropical Asia and now cultivated in the East and West Indies and in Africa. The rhizome contains a volatile oil and resin. It is used both externally as a rubefacient and internally as a carminative in abdominal cramp, diarrhea and indigestion.

GUM, BLUE (*Eucalyptus globulus*) N.O. The blue-gum tree is a native of Australia where it forms forests. It grows commonly now in southern California. The young trees or young branches produce broad ornate leaves which are deficient in volatile oils, hence the scythe-shaped *leaves* of the *mature* plant are used as a source of the volatile oil. It was used by the natives of Australia as a remedy for intermittent fever. In modern medicine the volatile oil is used as a stimulating and antiseptic expectorant.

HAW, BLACK (*Viburnum prunifolium*) N.F. A large shrub or small tree of eastern North America, growing abundantly in dry woods and thickets and on rocky hillsides in fertile soil. The stem and root bark is used medicinally as a uterine sedative and tonic.

HEMLOCK, POISON (*Conium maculatum*) N.O. Conium is a biennial herb native to Asia Minor and the islands of the Mediterranean. It has been introduced into most temperate regions. It is one of the most ancient of medicines and poisoning agents. Tradition has it that a decoction of this plant was the poison used by Socrates. It has also been used to some extent as an anodyne and depressant.

HEMP, INDIAN (*Cannabis sativa*) N.O. This plant was formerely an official drug, but the sale of the crude drug has been prohibited. The plant is an herbaceous annual, indigenous to Persia and northern India, and cultivated in many other countries. It has been known as a fiber plant in the East from prehistoric times. It was widely used as an intoxicant and narcotic by the orientals very much as opium. The seeds of the plant are expressed for the valuable fixed oil. In moderate amounts Cannabis is an excellent carminative, stomachic and analgesic, but owing to its illegitimate use as a narcotic it has fallen into disuse and its commerce is rigidly controlled. This narcotic is known as marihuana or hashish and is derived from the leaves, flowers, and resin of the hemp plant. It has been consumed extensively for about 3000 years in Far East, but has become a serious drug traffic problem in the U. S. only during the last fifteen years. In the U. S., the leaves, flowers, and resin are dried, mixed with tobacco and made into cigarettes.

HENBANE (*Hyoscyamus niger*) U.S.P. Henbane is a poisonous European herb, naturalized in this country and is extensively cultivated for the drug market, especially in Belgium. It has been employed in domestic medication since the remotest times and is mentioned in Anglo-Saxon works on medicine in the XI Century. Although the leaves are now specified as the part used in medicine, during the Middle Ages the roots and seeds were much used. Henbane is used as a carminative, cystic sedative and antispasmodic.

HOP (*Humulus Lupulus*) N.F. The hop plant is a dioecious, perennial, herbaceous, twining vine, native of Europe and Asia and cultivated in all temperate regions. Hop gardens existed in France and Germany in the VIII and IX centuries. It is said that William the Conqueror, 1069, granted the use of land for hop culture in England. It has always been used in decoction as a stomachic and diaphoretic. It has a peculiar diuretic action and is a distinct sedative nervine. Its use in the brewing industry to give a bitter flavor to beer and ale is well known.

HOREHOUND (*Marrubium vulgare*), Hoarhound, N.O. Horehound is a perennial herb, indigenous to Europe, but is naturalized in this country where it is very common. The entire plant has a white hoary appearance. It has a peculiar, rather agreeable, vinous, balsamic odor and a very bitter, aromatic and persistent taste. As a sweetened tea it has been long used in home medication. It is a stimulant tonic, expectorant and diuretic.

JIMSON WEED (*Datura Stramonium*), Jamestown weed, U.S.P. The stramonium plant is a tall, widely spreading, annual herb of unknown nativity, but now distributed abundantly in all temperate regions. Poisoning by stramonium is very common, either by children eating the seeds or from the leaves being used as a potherb, usually with fatal results. It is used chiefly as a remedy in asthma, by burning and inhaling the smoke, and is often made into cigarettes for this purpose. The leaves contain the alkaloids daturine and hyoscyamine, some atropine and scopalamine.

JOE-PYE WEED (*Eupatorium purpureum*), Trumpet weed, N.O. This plant is an herbaceous perennial growing in low places, dry woods and meadows in the eastern and western U. S. The root is the medicinal part, and was named after an Indian who lived in New England and employed it as a diaphoretic in fevers. It has an odor resembling old hay, and a slightly bitter, not unpleasant, aromatic taste. In the form of the decoction it has diuretic, stimulant and tonic effects upon the renal tract.

JUNIPER (*Juniperus communis*) N.F. The plant is a shrub common to the North Temperate Zone and the dried ripe berry-like fruit (galbulus) yields a volatile oil much used in medicine as a diuretic and carminative. The volatile oil is also a constituent of the popular spirit known as gin.

LARKSPUR (*Delphinium Ajacis*) N.F. This species of larkspur is a native of southern Europe and is commonly cultivated as a garden flower. Because of the poisonous alkaloids present in the seed it is largely used externally as a parasiticide; especially for head lice.

LAVENDER (*Lavandula spica*) N.O. Lavender is a low growing shrub native in the Mediterranean countries but widely cultivated especially in France and England. The whole plant is aromatic. The flowers have a rich peculiar fragrance which is retained long after drying, and a strong, bitter, aromatic, somewhat camphoraceous taste. Although the crude drug of *Lavandula spica* is not official, the oil distilled from the fresh flowering tops of *Lavandula officinalis* Chaix ex Villards (*L. vera* de Candolle) is official (*Oleum lavandulae* U.S.P.). The oil is largely used in pharmacy. It is an effective stimulant and carminative.

LICORICE (*Glycyrrhiza glabra*) and its varieties U.S.P. The licorice plants are low, soft-wooded shrubs of southern Europe and southwestern Asia. It has been an article of domestic use since the earliest days, and was common in England during the Middle Ages. The yellow wood of the rhizome and root is known as "sweet-wood," having a very fine flavor and agreeable taste. It is a distinct laxative, slightly diuretic and a useful expectorant. In licorice confections prepared from the extract, anise oil is so frequently used as an added flavor that it is often popularly confused with the taste of licorice. The powdered root is used as a pill excipient.

LILY-OF-THE-VALLEY (*Convallaria majalis*) N.F. This is a perennial herb, native of Europe and a favorite garden flower everywhere. The plant has been used in domestic medicine for several hundred years, being mentioned in the early Materia Medica of Dioscorides. The action and uses are almost identical with those of Digitalis and other cardiac stimulant drugs. The rhizome and roots have also been used in exterminating rodents. The active principle is convallarin. It can be standardized and serves a useful purpose in the medication of certain cardiac patients who are under constant treatment and have developed a resistance to digitalin.

MA HUANG. See EPHEDRA.

MANDRAKE (*Podophyllum peltatum*), May-Apple, N.F. The mandrake is a low perennial herb with long freely branching jointed rhizomes which root at the joints or nodes. Its therapeutic activity is due to a resinous principle found in the rhizome and roots. The rhizome was well known to the Indians as an active cathartic, both the Cherokees and the Wyandottes having used it for this purpose. The leaves are reputed to be poisonous, the young shoots of the plant being used by the aborigines for suicidal purposes.

MARIGOLD (*Calendula officinalis*), N.F. This annual is a native of southern Europe and adjacent Asia, and is commonly cultivated both for the drug and as a decorative plant. The foliage has an aromatic, somewhat narcotic, not unpleasant odor and a salty, rather disagreeable taste. It has been in use since medieval days as a household remedy, mainly as a vulnerary, stomachic and diaphoretic.

MOONSEED (*Menispermum canadense*), Canada moonseed, N.O. A herbaceous twiner, abundant in mountains and hilly forests throughout the eastern and central U. S. The rhizome and roots contain alkaloids and other bitter principles which give it medicinal value. Formerly used as a bitter tonic, stomachic and diuretic.

MULLEIN (*Verbascum Thapsus*), Flannel leaf, N.O. The mullein plant is a perennial herb with a tall stout single stem and a rosette of large, thick woolly radical leaves. It is a native of Europe, naturalized in the U. S. as a common, abundant, and pernicious weed. The leaves of this plant and flowers of related species contain small amounts of gum and oil and are used as poultices, demulcents and expectorants.

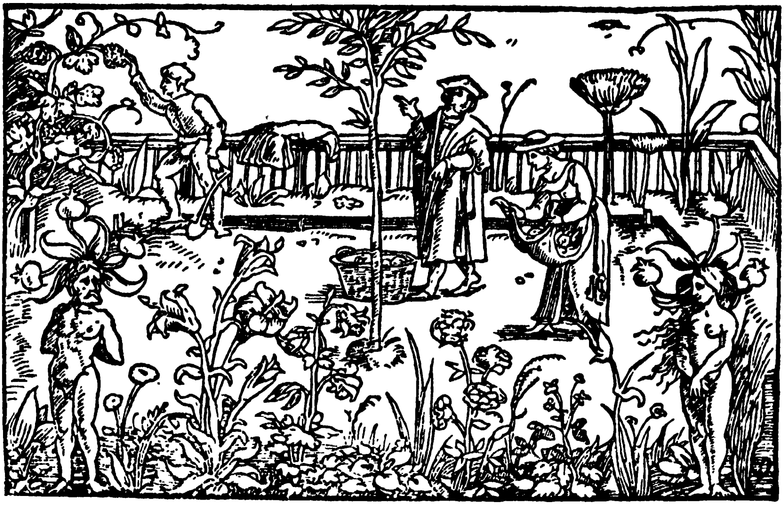

FIG. 11. Herb garden of the middle 16th century. Allegorical. In lower left corner a male mandrake (Mandragora), at the right a female mandrake. The brush-like plant near the upper right corner is probably a "Dragon-tree" (*Dracaena*). (After *Gart der Gesundheit*, Antwerp, 1533, from Arnold C. Klebs, *A catalog of early herbals.* L'Art Ancien, 1925, p. 31.) (10,634)

MUSTARD, BLACK (*Brassica nigra*), Brown mustard, U.S.P. The mustard plants are annuals, native to southern Europe and southwestern Asia, and largely cultivated in most temperate regions. It was used in early times more as a medicine than as a condiment. It is one of the most efficient rubefacients, a carminative and in slight overdoses a very prompt emetic.

NIGHTSHADE, DEADLY (*Atropa Belladonna*) U.S.P. The plant is a tall perennial herb, native of Europe and sparingly introduced into many temperate regions. It was introduced into European medicine at the beginning of the XVI Century and its use has continued up to the present day. The attractive black berries are extremely toxic and have caused fatal cases of poisoning when eaten by children. It is used as an anodyne in lumbago and rheumatism, also as a carminative and in abdominal colic. The alkaloid atropine is used by oculists for dilating the pupil in examinations of the eye. In 1940 the U. S. imported 125,394 lbs. valued at $50,309. This plant is one of the drug sources reduced seriously by the war. One commercial drug firm increased their annual acreage immediately from 50 to over 500 acres of this plant with the cooperation of the U. S. government.

OAT (*Avena sativa*) N.F. Oats have been noted by the ancient Greek and Roman writers; at present they are cultivated in nearly all northern temperate latitudes. Medicinally, Oat is a nutrient and to some extent a demulcent.

ORANGE (*Citrus aurantium* var. *sinensis*), Sweet orange, U.S.P. The sweet orange was introduced into Europe in the XV Century by the Portugese. The Arabs are credited with the introduction of the bitter orange long before, from its home in India where a wild orange still grows. The outer colored portion of the rind is used as a confection and flavoring agent due to the volatile oil present. The dried flowers are a source of a beverage tea.

ORRIS ROOT (*Iris florentina*), White flag, N.F. The rhizomes of this plant are collected and yield the so-called Orris root of commerce. The characteristic odor resembling violets is developed during the drying and curing process. The plant is widely cultivated for its flowers throughout Europe, being propagated by rhizome cuttings. Orris root is rarely employed in medicine, but large amounts are used in sachet powders and tooth powders.

PAWPAW (*Carica papaya*) N.O. The pawpaw tree is native to tropical America and is cultivated in other regions for its edible fruit. The fruit is large, melon-like and when incised exudes a milky juice. This juice is carefully dried and contains a proteolytic enzyme known as papain. This has digestant properties similar to those of the substance bromelin found in the pineapple and to pepsin.

PEPPER, BLACK (*Piper nigrum*) N.O. Black pepper has been used as a spice, condiment, and stomachic remedy since earliest times. It is native to Malabar and many Islands in the Indian Ocean and is now cultivated in many tropical countries. In many cases the commercial grades as Singapore, Penang, Malabar, Acheen and Sumatra are named after the localities of origin. Pepper is used chiefly as a flavoring agent: it is a stimulant to the mucous membranes and increases the secretions of the gastro-intestinal tract.

PEPPERMINT (*Mentha piperita*) U.S.P. This plant is indigenous to England and has been extensively cultivated in various parts of Europe and throughout the United States. Known to the ancient herbalists as "*Mentha palustris*—Peper-Mint" it was early cultivated for the distillation of its volatile oil. The plant is used in decoction as a diffusive stimulant and flavor, the presence of menthol in the volatile oil imparting a cool sensation when air is drawn into the mouth. Peppermint culture began in the U. S. in Wayne County, N. Y. State in 1820. Today it is grown commercially in southern Michigan and Indiana; and to a lesser extent in northern Ohio. Since 1936, experimental cultivation has been developed on the muck lands of Washington, Oregon, and California. Next to turpentine, peppermint oil is the largest essential oil produced in volume in the United States. Between 30,000 and 40,000 acres in the U. S. yield 350,000 to 400,000 pounds annually.

POKEWEED (*Phytolacca decandra*), Pigeonberry, N.F. Pokeweed is one of the largest perennial herbs of the United States, growing in rich soil along roadsides and woody pastures. It must not be confused with Indian Poke or Veratrum. The American Indians used the root pounded to a pulp as a poultice. The very young shoots of pokeweed are often used as a pot-herb, like asparagus. The saponin present gives the drug its alterative and emetic properties. It was formerly used in obesity but such use is not without danger. The roots, fruits, and seeds are poisonous if taken internally. Pokeweed has been used to adulterate *Atropa Belladonna,* the source of atropine.

POMEGRANATE (*Punica granatum*) N.O. One of the most ancient of oriental cultivated fruits, it has been introduced into all tropical and warm temperate regions. The fruit was held sacred by the Assyrians and the Egyptians, being used as a mystical emblem and appearing on coins and on columns. It is mentioned in the Bible as one of the fruits brought back to Moses by the men sent to spy out the land of promise. The ancient Greek and Roman authors describe the virtues of different parts of the plant. Decoctions of the bark have been used since time immemorial for the removal of tapeworm and other intestinal parasites.

POPPY, OPIUM (*Papaver somniferum*). Opium, U.S.P. The capsule of the poppy is carefully incised and the dried exuded latex constitutes the opium of commerce. The plants are cultivated in the opium producing countries, among which are Turkey, Persia, India, China, and Egypt. Seed is sown in the fall, but growth of the plants is arrested by cold and snow so that they do not flower until the following season. Many alkaloids are present, the more important being morphine and codeine. The latter is used to allay pulmonary irritation and to check coughing. Morphine depresses the activity of the entire nervous system, especially the sensory centers, and is specific for the relief of pain. Its use as a narcotic is well known.

PSYLLIUM SEED (*Plantago Psyllium*), Plantain seed, N.F. Several species of the genus Plantago yield the seed used in medicine. The plants are cultivated in Europe especially in Spain and France. Large amounts of seed are imported from India which produces the blond or white psyllium seed from *P. ovata.* The seeds are very rich in gum which swells upon contact with liquids yielding a mucilage which because of its bulk and lubricating properties acts as a mild but efficient laxative.

PUMPKIN (*Cucurbita Pepo*) N.O. The plant is reputed to be a native of the Levant from whence it has been introduced throughout the world. The seeds contain a principle which is very effective against intestinal worms, and it has been used for this purpose.

RHUBARB (*Rheum palmatum*) U.S.P. also known as Rhubarb root. It grows in China and Thibet from which countries it has been exported since the earliest times. It is mentioned in Chinese herbals dating from 2700 B.C. Highly valued in European countries during the Middle Ages, it was one of the very costly drugs, worth 12 times the price of benzoin; 10 times as much as cinnamon, more costly than opium, and 6 times as dear as fine myrrh. The common garden rhubarb or pie plant *R. rhaponticum* is a botanical relative. The medicinal rhubarb is one of the best bitter tonics and laxative drugs in materia medica.

ROSEMARY (*Rosmarinus officinalis*) N.O. Rosemary is a native of the countries surrounding the Mediterranean, being extensively cultivated for its beauty and fragrance. The parts used in medicine are the flowering tops which have a powerful diffusive camphoraceous odor due to the volatile oil. It is a stimulant, carminative, and diaphoretic, and is much used in perfumery. Although the crude drug is not official, the oil, *Oleum Rosmarini,* U.S.P. is official.

SAFFLOWER (*Carthamus tinctorius*), False saffron, N.O. Annual, cultivated in India and Mexico for the drug market where it is known as American saffron. It is used as a coloring agent and also to some extent in dyeing and rouge-making. In domestic practice the hot infusion is often employed as a diaphoretic.

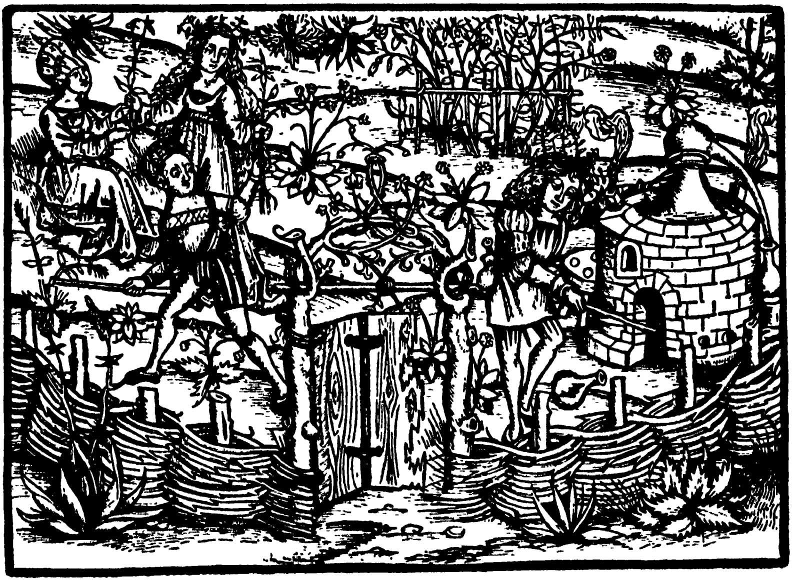

FIG. 12. Ancient distillation, pictured (fancifully in all probability) as taking place in a garden where, besides the two apothecaries, two women are engaged in gathering medicinal plants. From Hermann Peters, *Pictorial History of Ancient Pharmacy*. English translation by William Netter. Chicago, 1889. (10,602)

SAGE, GARDEN (*Salvia officinalis*) N.F. Sage has been used by the herbalists since ancient times. It is native to Southern Europe and is now cultivated in all temperate climates for use as a condiment or medicine. The ancients used a preparation of sage to darken the hair. Medicinally it has stomachic and tonic properties, is distinctly anthelmintic and a mild diuretic. It makes an efficient gargle in mild cases of laryngitis.

SAVIN (*Juniperus Sabina*) N.O. This plant is indigenous to middle and southern Europe, Siberia and the northern part of North America. It has been used in veterinary medicine since the Norman Conquest, and is also mentioned in the early domestic "leech books." Charlemagne ordered that it should be planted on the imperial farm. It has been used as an emmenagogue, diuretic, diaphoretic, and anthelmintic; but in overdoses it is extremely irritant and has produced fatal results. Due to its action upon the uterus it has been used in illegal medicine to induce abortion.

SPEARMINT (*Mentha spicata*) U.S.P. A common perennial of Europe, Asia, and North America and found in most of the temperate regions of the world. It has been cultivated since early medieval times and is included in the old "Herbals" under the title "Spere Mynte." Medicinally its use depends upon a volatile oil which is a popular flavor, and is also carminative and stimulant. Spearmint constitutes 10 per cent of the annual mint crop of the U. S.

SUNFLOWER (*Helianthus annuus*) N.O. This well known plant is a native of South America and is extensively cultivated in this country on account of its beautiful brilliant yellow flowers. The seeds are used because of the fixed oil present, and which may be obtained by expression. Preparations of the seed have diuretic and expectorant properties.

TANSY (*Tanacetum vulgare*) N.O. Tansy is a perennial herb of Europe and Asia, and thoroughly naturalized in the United States. The entire plant is medicinal. It has an unpleasant, aromatic odor and a strong, pungent, and bitter taste, which is due to the volatile oil. Tansy has been used as a stomachic, tonic, emmenagogue, and diaphoretic. The volatile oil has been used as a diuretic and also as an anthelmintic for the expulsion of worms, particularly in children.

THOROUGHWORT (*Eupatorium perfoliatum*), Boneset, N.F. One of the commonest and most abundant perennial herbs of the eastern and central United States. It grows in low meadows but not where the ground is actually wet. In the form of the infusion of tea it was very popular with the early settlers as a diaphoretic and bitter tonic. The aborigines employed several species of Eupatorium for the same purposes.

THYME, GARDEN (*Thymus vulgaris*) N.F. The plant is a small perennial herb, native to southern Europe and is extensively cultivated both as a condiment and drug. It contains a volatile oil which yields thymol, a phenolic substance much used in the treatment of hookworm. The herb is used as a flavoring agent and condiment, as a carminative and antispasmodic, particularly in whooping cough.

TOBACCO (*Nicotiana Tabacum*) N.O. The tobacco plant is a tall annual, native to the warmer parts of North America. It is cultivated today in all parts of the world which have a suitable climate. The Spaniards carried it to Europe on their return from discovering America, and it was first brought to England in 1586 by Sir Walter Raleigh. The drug has been used as a sedative, diuretic, and expectorant. The poisonous symptoms are frequently exhibited by those who smoke for the first time, the effects being not unlike those of seasickness. The alkaloid nicotine is much used as an insecticide in various plant sprays.

VALERIAN (*Valeriana officinalis*) N.F. The dried rhizome and roots of this plant contain a strong smelling volatile oil which is developed during the drying and curing process. Formerly this odor was appreciated as a perfume but now is considered exceedingly unpleasant. It has been used as a stimulant and antispasmodic in nervous conditions, and also as a carminative.

WAHOO (*Euonymus atropurpureus*), Burning Bush, N.F. A large shrub or a small tree growing abundantly throughout the eastern and central United States. The bark of the root was one of the staple remedies of the aborigines. Medicinally it acts much like podophyllum as a tonic laxative and is useful in overcoming chronic constipation.

WORMSEED, AMERICAN (*Chenopodium ambrosioides* var. *anthelminticum*) N.O. The plant is an aromatic perennial herb growing in waste places in almost all parts of the United States. The value of the drug as an anthelmintic was established many generations ago, and today the volatile oil of the plant is widely used for the expulsion of intestinal worms. It is particularly effective against roundworms and for hookworm.

WORMWOOD (*Artemisia absinthium*) N.O. The perennial herb is native of southern Europe and adjacent Asia and, through cultivation, has become widely distributed. The plant has been used in domestic medicine as a stomachic and anthelmintic, similarly as in tansy and wormseed. It is diaphoretic and diuretic and in alcoholic beverages has pronounced narcotic properties.

## A SHORT LIST OF WORKS IN THE LIBRARY OF THE BROOKLYN BOTANIC GARDEN DEALING WITH THE EARLY USE OF PLANTS IN MEDICINE

BY WILLIAM E. JORDAN, LIBRARIAN

ARBER, AGNES. Herbals, their origin and evolution, a chapter in the history of botany, 1470–1670. Cambridge, University press, 1912.

THE BADIANUS MANUSCRIPT . . . An Aztec herbal of 1552. Introduction, translation and annotations by Emily Walcott Emmart . . . Baltimore, Johns Hopkins press, 1940.

GREENE, EDWARD LEE. Landmarks of botanical history. Washington, D. C., Smithsonian Institution, 1909. (Chapter I: The Rhizotomi, p. 45–51.)

LAWALL, CHARLES HERBERT. The curious lore of drugs and medicines; (four thousand years of pharmacy). Garden City, N. Y., Garden City Publishing Company, 1927.

PETERS, HERMANN. Pictorial history of ancient pharmacy; with sketches of early medical practice . . . translated from the German, and revised, with numerous additions by Dr. William Netter. Chicago, G. P. Engelhard, 1889.

ROHDE, ELEANOUR SINCLAIR. The old English herbals. London, Longmans, Green and Co., 1922.

SCHMIDT, ALFRED. Drogen und Drogenhandel im Altertum. 2d ed. Leipzig, J. A. Barth, 1927.

Singer, Charles. From magic to science. New York, Boni and Liveright, 1928. (Chapter 4: Early English magic and medicine. Chapter 5: Early herbals, p. 133–198.)

Singer, Charles. Studies in the history and method of science. Vol. 2. Oxford, Clarendon press, 1921. (Chapter 1: Greek biology and its relation to the rise of modern biology, p. 1–101.)

Note: In addition to the above listed works the library has a collection of early herbals and other works including those by Bock, Brunfels, Coles, Culpeper, Dodoens, Fuchs, Gerarde, Lobel, Mattioli, Porta, Theophrastus, and others. A description of these is contained in the Brooklyn Botanic Garden Record, Vol. 24, No. 3, July 1935, "Books and manuscripts illustrating the history of botany." The library also has the *United States Pharmacopoeia* and the *National Formulary,* as well as other modern works on medicinal plants.

# THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

FOUNDED, 1824. REINCORPORATED, 1890

ADRIAN VAN SINDEREN, *President.* EDWARD C. BLUM, *Chairman of the Board.*

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## BROOKLYN BOTANIC GARDEN

1000 WASHINGTON AVENUE—MAin 2-4433

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CENTRAL MUSEUM—EASTERN PARKWAY—NEvins 8-5000
CHILDREN'S MUSEUM—BROOKLYN AVENUE AND PARK PLACE
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# PRIVILEGES OF MEMBERSHIP IN THE BROOKLYN BOTANIC GARDEN

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The Brooklyn Botanic Garden renders a public service in its endeavor to advance a knowledge of plants, affording educational advantages, and carrying on fundamental investigations. Members of the Garden have the opportunity of furthering these aims.

Special membership privileges are also offered as follows:

1. Advice on the choice and care of ornamental trees, shrubs, and herbaceous plants, and the best ways to grow plants successfully, involving methods of culture, and control of insect and fungous pests.
2. The naming of botanical specimens submitted for determination.
3. Periodical distribution of surplus ornamental plant material and seeds.
4. Invitations for self and friends to the Annual Spring Inspection, and to spring and fall "Flower Days"; cards of admission to all exhibitions and openings preceding the admission of the general public, and to receptions; admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Services of a guide (by appointment) for self and party, when visiting the Garden.
6. Free tuition in all courses of instruction, except that in laboratory courses a small fee is charged to cover cost of materials, etc.
7. The Library and Herbarium are available for consultation.
8. Announcement cards concerning plants in bloom and the activities of the Garden are sent to members from time to time.
9. As part of its services, the Brooklyn Botanic Garden issues publications of general horticultural interest, and technical papers based upon the researches carried on at the Garden. Special *Guides* to the plantations and collections, *Leaflets* of popular information, and the quarterly *Record,* which includes the *Annual Report* of the Garden's activities, are sent free to members.
10. Membership privileges in other botanic gardens and museums outside of Greater New York are offered to our members when they are visiting other cities and on presentation of Brooklyn Botanic Garden membership card.

## CLUB MEMBERSHIPS

For many years the Botanic Garden has had the pleasure of cooperating in numerous ways with Garden Clubs, Women's Clubs, and other organizations of the Metropolitan area, and a plan has been adopted whereby such organizations may become definitely identified with the work of the Garden in promoting an interest in plant life and horticulture, as follows:

*Annual Memberships.*—Garden Clubs or other organizations may qualify as Annual Members of the Garden on election by the Board of Trustees and payment of the annual membership fee of Ten Dollars. Each annual member club may designate one of its officers or other member to receive such invitations, notices, and publications as go to individual annual members and to represent the club at all Botanic Garden functions, including "Flower Days" and the annual Spring Inspection in May.

The Club may also have the following privileges:

*a.* *The services of a Botanic Garden docent or guide* for a tour of the plantations or conservatories, followed by tea. No parties of less than six adults will be conducted. Schedule for such events must be arranged for in advance, at dates mutually convenient to the Botanic Garden and the Club.

*b.* *One extra-mural lecture a year* by a member of the Garden staff. The Garden supplies, on request, a list of staff members available for outside lectures.

Arrangements will be facilitated if the Club will, with each request, designate at least two names.

*c.* One member of the club is entitled annually to free tuition in courses of instruction for which tuition is charged to non-members. In Laboratory Courses a nominal fee is charged to cover cost of material.

*Sustaining Memberships.*—Any club or other organization may become a Sustaining Member of the Garden on election by the Board of Trustees and annual payment to the Garden of the sustaining membership fee of Twenty-five Dollars.

Sustaining membership clubs enjoy the full privileges of annual membership, not only in the Botanic Garden but also in the Brooklyn Museum and The Institute at the Academy of Music. They may designate three members who may receive free tuition in Botanic Garden courses of instruction for which tuition is charged to non-members. They are entitled each year to two extra-mural lectures free, by a lecturer chosen from the Garden's list of lecturers.

## OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
Berkshire Museum, Springfield, Mass.
Boston Society of Natural History, Boston, Mass.
Buffalo Museum of Science, Buffalo, N. Y.
California Academy of Sciences, San Francisco, Calif.
Carnegie Museum, Pittsburgh, Pa.
Charleston Museum, Charleston, S. C.
Cranbrook Institute of Science, Bloomfield Hills, Mich.
Everhart Museum of Natural History, Science and Art, Scranton, Pa.
Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
Field Museum of Natural History, Chicago, Ill.
Los Angeles Museum, Los Angeles, Calif.
Massachusetts Horticultural Society, Boston, Mass.
Missouri Botanical Garden, St. Louis, Mo.
Newark Museum, Newark, N. J.
New York State Museum, Albany, N. Y.
Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
Pennsylvania Horticultural Society, Philadelphia, Pa.
Philadelphia Commercial Museum, Philadelphia, Pa.
Southwest Museum, Los Angeles, Calif.

## V

## CLASSES OF MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following eight classes of membership may be taken out through the Botanic Garden:

| | |
|---|---|
| 1. Annual, by annual payment of ....... | $ 10 |
| 2. Sustaining, by annual payment of .... | 25 |
| 3. Contributing, by annual payment of .. | 100 |
| 4. Life, by one payment of ............. | 500 |
| 5. Permanent, by one payment of ....... | 2,500 |
| 6. Donor, by one payment of ........... | 10,000 |
| 7. Patron, by one payment of .......... | 25,000 |
| 8. Benefactor, by one payment of ....... | 100,000 |

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to eight carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members also enjoy the special privileges indicated on a preceding page.

Further information concerning membership may be had by addressing The Director, Brooklyn Botanic Garden, Brooklyn, N. Y., or by personal conference by appointment. Telephone, Main 2-4433.

NOTE: *Contributions to the Brooklyn Botanic Garden, through membership dues or otherwise, constitute proper deductions under the Federal and New York State Income Tax Laws.*

# FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

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### Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which said sum to be used exclusively for the educational and scientific work of the Brooklyn Botanic Garden.

### Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

### Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which sum to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as the ..............................................fellowship.

### Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *

...............................................................

...............................................................

* The following additional purposes are suggested for which endowment is needed:

1. Botanical research.
2. Publishing the results of botanical research.
3. The endowment of special gardens and collections.
4. The Library.
5. The Herbarium.
6. Extending and enriching our work of public education.
7. The purchase and collecting of plants.
8. Popular botanical publication. .
9. Illustrations for publications and lectures.
10. The beautifying of the grounds.

## vii

## THE BOTANIC GARDEN AND THE CITY

THE BROOKLYN BOTANIC GARDEN, established in 1910, is a Department of the Brooklyn Institute of Arts and Sciences. It is supported in part by municipal appropriations, and in part by private funds, including income from endowment, membership dues, and special contributions. Its articulation with the City is through the Department of Parks.

The City owns the land devoted to Garden purposes, builds, lights, and heats the buildings, and keeps them in repair, and includes in its annual tax budget an appropriation for other items of maintenance. One third of the cost of the present buildings (total cost, about $300,000), and other permanent improvements to a total of more than $281,000, has been met from private funds.

Appointments to all positions are made by the director of the Garden, with the approval of the Botanic Garden Governing Committee, and all authorized expenditures for maintenance are made in the name of the private organization, from funds advanced by the Institute, which, in turn, is reimbursed from time to time by the City, within the limits, and according to the terms of the annual Tax Budget appropriation. Certain salaries are paid, in whole or in part, from private funds.

All plants have been purchased with private funds since the Garden was established. In addition to this, it has been the practice of the Garden, from its beginning, to purchase with private funds all publications for the library, all specimens for the herbarium, all lantern slides and photographic material, and numerous other items. These collections, available without charge for public use, are the property of the Trustees.

The interest on One Million Dollars at the rate of 3.5 per cent, added to the present private funds income, would restore that income to the 1930 figure. The director will be glad to give full information as to the uses for which such additional income is needed.

# REGULATIONS CONCERNING PHOTOGRAPHING, PAINTING, AND SKETCHING

1. No permit is required for photographing with a hand camera, or for sketching or painting without an easel on the Grounds or in the Conservatories.

2. Sketching and painting with an easel and the use of a camera with tripod are not allowed in the Oriental Garden, the Rose Garden, the Local Flora Section (Native Wild Flower Garden), nor the Conservatories at any time without a permit. No permits are given for use after 12 o'clock noon on Sundays and holidays.

3. Artists, and the public in general, may not bring into the Botanic Garden chairs, stools, or anything to sit in or on.

4. Holders of permits must not set up tripod cameras nor easels in such a way as to involve injury to living plants or lawns, nor to cause an obstruction to traffic on paths or walks.

5. Application for permits should be made at the office of the Director, Laboratory Building, Room 301, or by mail (1000 Washington Avenue), or by telephone (MAin 2-4433).

# THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

**FOUNDED, 1824. REINCORPORATED, 1890**

ADRIAN VAN SINDEREN, *President.* EDWARD C. BLUM, *Chairman of the Board.*

## THE DEPARTMENT OF EDUCATION

**BROOKLYN ACADEMY OF MUSIC—30 LAFAYETTE AVENUE—STerling 3-6700**

## BROOKLYN BOTANIC GARDEN

**1000 WASHINGTON AVENUE—MAin 2-4433**

## THE BROOKLYN MUSEUM

**CENTRAL MUSEUM—EASTERN PARKWAY—NEvins 8-5000**
**CHILDREN'S MUSEUM—BROOKLYN AVENUE AND PARK PLACE**
**—PRospect 3-7117**

## MEMBERSHIP

You are cordially invited to become a member of one or all of the Departments of the Brooklyn Institute. The annual fee in each Department is $10, carrying full privileges in the division of your choice and partial privileges in the other two. Membership runs for twelve months from the time it is taken out.

**THE DEPARTMENT OF EDUCATION** offers its members free admission to more than 250 events: lectures, concerts, motion pictures, young people's programs, field trips, etc. Also: reduced rates for special courses and programs.

ADRIAN VAN SINDEREN, *Chairman, Governing Committee.* JULIUS BLOOM, *Director.*

**THE BOTANIC GARDEN** offers its members free admission to "Flower Days," Spring Inspection, field trips, and most classes of instruction. Also: docent services, privileges of library and herbarium, free publications, advice on all aspects of gardening, distribution of surplus plant material, and visiting membership privileges in the botanic gardens and museums of other cities.

MISS HILDA LOINES, *Chairman, Governing Committee.* DR. C. STUART GAGER, *Director.*

**THE MUSEUM** offers its members private views of exhibitions, admission to Museum courses, phonograph records and prints from its lending libraries, and docent services. Also: five Museum publications free of charge and other Museum publications at reduced prices.

WALTER H. CRITTENDEN, *Chairman, Governing Committee.* LAURANCE P. ROBERTS, *Director.*

**THE BROOKLYN ACADEMY OF MUSIC** is owned and operated by the Brooklyn Institute. Its Opera House, Music Hall, and Ballroom may be rented for concerts, plays, lectures, school ceremonies, dances, and other events.

WILLIAM T. HUNTER, *Chairman, Building Committee.* HERBERT T. SWIN, *Building Superintendent.*

# PRIVILEGES OF MEMBERSHIP IN THE BROOKLYN BOTANIC GARDEN

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The Brooklyn Botanic Garden renders a public service in its endeavor to advance a knowledge of plants, affording educational advantages, and carrying on fundamental investigations. Members of the Garden have the opportunity of furthering these aims.

Special membership privileges are also offered as follows:

1. Advice on the choice and care of ornamental trees, shrubs, and herbaceous plants, and the best ways to grow plants successfully, involving methods of culture, and control of insect and fungous pests.
2. The naming of botanical specimens submitted for determination.
3. Periodical distribution of surplus ornamental plant material and seeds.
4. Invitations for self and friends to the Annual Spring Inspection, and to spring and fall "Flower Days"; cards of admission to all exhibitions and openings preceding the admission of the general public, and to receptions; admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Services of a guide (by appointment) for self and party, when visiting the Garden.
6. Free tuition in all courses of instruction, except that in laboratory courses a small fee is charged to cover cost of materials, etc.
7. The Library and Herbarium are available for consultation.
8. Announcement cards concerning plants in bloom and the activities of the Garden are sent to members from time to time.
9. As part of its services, the Brooklyn Botanic Garden issues publications of general horticultural interest, and technical papers based upon the researches carried on at the Garden. Special *Guides* to the plantations and collections, *Leaflets* of popular information, and the quarterly *Record,* which includes the *Annual Report* of the Garden's activities, are sent free to members.
10. Membership privileges in other botanic gardens and museums outside of Greater New York are offered to our members when they are visiting other cities and on presentation of Brooklyn Botanic Garden membership card.

## CLUB MEMBERSHIPS

For many years the Botanic Garden has had the pleasure of cooperating in numerous ways with Garden Clubs, Women's Clubs, and other organizations of the Metropolitan area, and a plan has been adopted whereby such organizations may become definitely identified with the work of the Garden in promoting an interest in plant life and horticulture, as follows:

*Annual Memberships.*—Garden Clubs or other organizations may qualify as Annual Members of the Garden on election by the Board of Trustees and payment of the annual membership fee of Ten Dollars. Each annual member club may designate one of its officers or other member to receive such invitations, notices, and publications as go to individual annual members and to represent the club at all Botanic Garden functions, including "Flower Days" and the annual Spring Inspection in May.

The Club may also have the following privileges:

*a. The services of a Botanic Garden docent or guide* for a tour of the plantations or conservatories, followed by tea. No parties of less than six adults will be conducted. Schedule for such events must be arranged for in advance, at dates mutually convenient to the Botanic Garden and the Club.

*b. One extra-mural lecture a year* by a member of the Garden staff. The Garden supplies, on request, a list of staff members available for outside lectures.

Arrangements will be facilitated if the Club will, with each request, designate at least two names.

*c.* One member of the club is entitled annually to free tuition in courses of instruction for which tuition is charged to non-members. In Laboratory Courses a nominal fee is charged to cover cost of material.

*Sustaining Memberships.*—Any club or other organization may become a Sustaining Member of the Garden on election by the Board of Trustees and annual payment to the Garden of the sustaining membership fee of Twenty-five Dollars.

Sustaining membership clubs enjoy the full privileges of annual membership, not only in the Botanic Garden but also in the Brooklyn Museum and The Institute at the Academy of Music. They may designate three members who may receive free tuition in Botanic Garden courses of instruction for which tuition is charged to non-members. They are entitled each year to two extra-mural lectures free, by a lecturer chosen from the Garden's list of lecturers.

## OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
Berkshire Museum, Springfield, Mass.
Boston Society of Natural History, Boston, Mass.
Buffalo Museum of Science, Buffalo, N. Y.
California Academy of Sciences, San Francisco, Calif.
Carnegie Museum, Pittsburgh, Pa.
Charleston Museum, Charleston, S. C.
Cranbrook Institute of Science, Bloomfield Hills, Mich.
Everhart Museum of Natural History, Science and Art, Scranton, Pa.
Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
Field Museum of Natural History, Chicago, Ill.
Los Angeles Museum, Los Angeles, Calif.
Massachusetts Horticultural Society, Boston, Mass.
Missouri Botanical Garden, St. Louis, Mo.
Newark Museum, Newark, N. J.
New York State Museum, Albany, N. Y.
Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
Pennsylvania Horticultural Society, Philadelphia, Pa.
Philadelphia Commercial Museum, Philadelphia, Pa.
Southwest Museum, Los Angeles, Calif.

## V

## CLASSES OF MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following eight classes of membership may be taken out through the Botanic Garden:

| | | |
|---|---|---|
| 1. Annual, by annual payment of ....... | $ | 10 |
| 2. Sustaining, by annual payment of .... | | 25 |
| 3. Contributing, by annual payment of .. | | 100 |
| 4. Life, by one payment of ............. | | 500 |
| 5. Permanent, by one payment of ....... | | 2,500 |
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## vii

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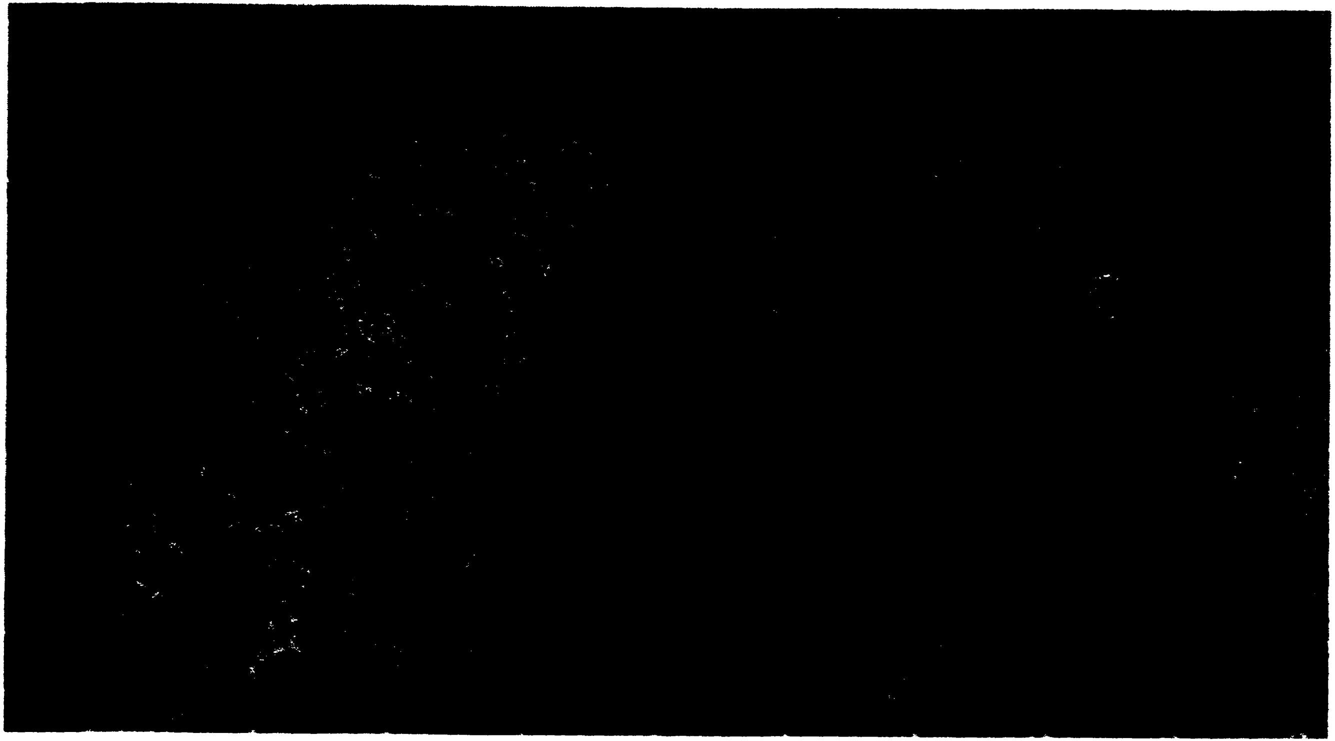

View in one of our Victory Gardens, showing beets, carrots, parsnips, and Swiss chard. (10711).

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXXII OCTOBER, 1943 NO. 4

# PROSPECTUS: 1943–1944

## COURSES OF INSTRUCTION

Courses for adults and children are classified in the following pages as follows:

For members and the general public:
  Victory garden courses ("V" courses, p. 213)
  Regular courses ("A" courses, p. 216)
For teachers ("B" courses, p. 218)
For children ("C" courses, p. 220)
For special groups ("D" courses, p. 221)
Investigation ("E" courses, p. 221)

*Any course may be withdrawn when less than ten persons apply for registration.*

**Registration.**—Because of the limited space available in the instructional greenhouses, and for other reasons, the number of persons that can be registered in many of the courses must be limited. Those who desire to attend any course are urged to send in their applications, with entrance fees, to the Secretary, Brooklyn Botanic Garden, several days in advance of the first meeting. This avoids delay at the beginning of the first session, ensures a place in the course, and enables the instructor to provide adequate material for the class.

Persons are requested not to register in any course unless they are reasonably confident that they can attend the sessions regularly and throughout. This is especially important where the number is limited; for it is obvious that those who register and do not attend may deprive someone else of the privilege of attending.

**V and A Courses.**—Although these courses are designed primarily for Members of the Botanic Garden, they are open (unless otherwise specified) to any one who has a general interest in plants. Teachers are welcome. Starred courses (*) are open also for credit to students of Long Island University, and are described in the current Long Island University catalog. In harmony with an agreement entered into in the spring of 1935, the Botanic Garden, upon recommendation of the Chairman of the Biology Department of Long Island University, offers a course scholarship to one student of the University. A similar arrangement has been made with Brooklyn College. (Cf. p. 216, foot-note.)

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| | Date of First Meeting | Page |
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## V. Victory Garden Courses

## For Members and the General Public

### FALL

**V1. Your Garden This Fall.**—*Five Mondays, 10:30 a.m., October 4 to November 1.* Getting ready for next year's Victory Garden. Soil improvement by means of cover crops; fall planting for early vegetables; pruning; propagating; planting useful and ornamental trees and shrubs; dormant spraying; putting the garden to bed. *No fee.* Mr. Free.

**V4. House Plants.**—*Five Wednesdays, 10:30 a.m., November 3 to December 1.* House plants for decoration and interest. How to make them thrive. Raising new plants, which become the property of class members. Instruction in potting, making cuttings, mixing soils, etc. On account of limited space in the greenhouses, this class must be limited to 50 persons. Registration according to the order of application. *Fee to non-members, $5 (including laboratory fee); to members, $2 laboratory fee.* Mr. Free.

**V13. Jellies, Jams, and Preserves.**—*One demonstration, Monday, September 27, 10:30 a.m. to 12 m.* Actual processes shown. *No fee.* Mrs. H. K. Svenson.

## WINTER

**V7. Relations of Plants to Mankind.**—*Six Mondays, 10:30 a.m., February 14 to March 20.* A series of lectures on plants and plant uses of vital importance to human beings. *No fee.*

February 14. Beverages around the World. Dr. Cheney.
February 21. Poison Ivy and Other Skin-Irritating Plants. Miss Rusk.
February 28. Wheat, Rice, and Corn. Dr. Reed.
March 6. The Strange History of Quinine and Malaria. Dr. Svenson.
March 13. Wood, the Modern Miracle Material. Dr. Graves.
March 20. The History of Common Vegetables in the Victory Garden. Miss Dorward.

**V22. Tropical Plants Important in the War Effort.**—*Six Wednesdays, 3 p.m., January 12 to February 16.* Guided tours through the Conservatories of the Botanic Garden, with informal, non-technical talks on plants there which are important economically or of especial interest at the present time. *Fee to non-members, $1.*

January 12. Rubber and Gum Plants.
January 19. Beverage Plants.
January 26 and February 2. Food Plants.
February 9. Fiber Plants.
February 16. Medicinal Plants.

Dr. Graves, Miss Rusk.

### SPRING

**"Information Please."**—*One session, Saturday, March 4, 2:30 p.m.* An hour of consultation for those who are planning their 1944 Victory Garden. Bring your garden problems. *No fee.*
Mr. Free.

**V3. Herbs: How to Grow and Use Them.**—*Six Tuesdays, 10:30 a.m., March 7 to April 11.* Lectures and practical work in the greenhouses. Plants raised become the property of class members. *Fee to non-members, $5 (including laboratory fee); to members, $2 laboratory fee.*

March 7. Planning the Herb Garden. Miss Van Brunt.
March 14. Lecture: Herb Culture. Miss Van Brunt.
Greenhouse Work: Starting Herbs from Cuttings. Miss Dorward.
March 21. The Use of Herbs in Cooking. Practical Demonstrations. Mrs. H. K. Svenson.
March 28. Lecture: The History of Herbs.
Miss Van Brunt.
Greenhouse Work: Starting Herbs from Seed.
Miss Dorward.
April 4. Harvesting and Drying Herbs. Miss Van Brunt.
April 11. Lecture: Planting the Herb Garden.
Miss Van Brunt.
Greenhouse Work: Potting up Rooted Cuttings; Pricking out Seedlings. Miss Dorward.

**V8. The Small Vegetable and Flower Garden.**—*Five Wednesdays, 10:30 a.m., February 23 to March 22.* The preparation of soil, pruning of roses, raising of seedlings; greenhouse and practical work in pricking. Class limited to 45 persons. *Fee to* *non-members, $6 (including laboratory fee); to members, $2 laboratory fee.* Miss Shaw, Miss Dorward, Miss Clarke.

**V10. Gardening for Food and Vitamins.**—*Six Thursdays, 10:30 a.m., March 2 to April 6.* Getting the most from a small plot by companion and succession cropping. Soil improvement and maintenance of fertility. Seed sowing, indoors and out; thinning; cultivating; harvesting and storing. Vegetables which usually are raised under glass are started by class members, who have the privilege of keeping the young plants thus raised. Largely seeing and doing. Limited to 50 persons. *Fee to non-members, $5 (including laboratory fee); to members, $2 laboratory fee.* Mr. Free.

**V11. Gardening for Victory.**—*Five Fridays, 10:30 a.m., March 3 to 31.* How to brighten your surroundings and raise food economically. The cultivation of easy-to-raise vegetables and flowers, especially in small gardens. Lectures and demonstrations. *No fee.* Mr. Free, Miss Dorward.

## A. Regular Courses for Members and the General Public

### FALL

***A5. Trees and Shrubs in Winter.**—*Ten Saturdays, 2:30 p.m., October 2 to December 4.* Outdoor lessons, in the Botanic Garden and in the parks and woodlands of Greater New York, on the characteristics of our common trees and shrubs, both native and cultivated, emphasizing their distinguishing features in the winter condition. The habits, requirements as to soil, etc., and the use of various species in landscape art are also discussed. *Fee to non-members, $3.* The first session will be held at the Brooklyn Botanic Garden. Dr. Graves.

***A18. Wild Flowers and Ferns: Field and Laboratory Study.**—*Thirty Thursdays, 4 to 6 p.m., beginning September 23.* A series of two-hour sessions for those who wish to become better acquainted with wild flowers. Field and laboratory work are distributed according to the weather, the season, and the needs of the class. The field work is done in the Brooklyn Botanic Garden.

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* All starred courses are open for university or college credit to students of Long Island University and Brooklyn College. See pages 212 and 219.

In the laboratory, plants are studied for flower structure and family relationships, compared and identified, and mounted as permanent specimens. Fresh plants are pressed during the growing season; dried and preserved plants are used in the winter. *Fee to non-members, $8 (including laboratory fee); to members, $3 laboratory fee.* Miss Rusk.

**A31. Ornamental Shrubs.**—*Five Mondays, 3:30 p.m., October 18 to November 15.* Outdoor trips in the Botanic Garden, to study the common species and varieties of cultivated shrubs, emphasizing those desirable for planting on the home grounds. Fall flowers and fruits of ornamental shrubs and small trees, also evergreen shrubs, are considered. *Fee to non-members, $1.50.* Mr. Doney.

### SPRING

**A8. Trees in the Botanic Garden.**—*Eight Mondays, 3:45 to 5 p.m., April 10 to May 29.* Outdoor meetings in the Botanic Garden to study more than 100 species of trees, native and cultivated, growing in the Garden, including their economic uses and value in landscape art. *Fee to non-members, $2.50.* Dr. Graves, Dr. Gundersen.

***A9. Trees and Shrubs in Spring and Summer.**—*Ten Saturdays, 2:30 p.m., April 15 to June 17.* Outdoor lessons in the Botanic Garden and in the parks and woodlands of Greater New York. Similar to A5, except that the different species are studied in their spring and summer conditions. *Fee to non-members, $3.* Dr. Graves.

**A11. Wild Flowers and Ferns: Field Course.**—*Six Saturdays, 2:30 p.m., April 29 to June 3.* Trips in the Botanic Garden and in the woodlands near the City, for field identification of flowers and ferns of spring and early summer. *Fee to non-members, $2.* First meeting at the Botanic Garden. Miss Rusk.

**A12. Wild Flowers and Ferns in the Botanic Garden.**—*Eight Monday evenings, 6:30 to 8, April 24 to June 12.* Visits to the Wild Flower Garden of the Botanic Garden, where a large proportion of our most attractive native plants are growing. No rough walking. *Fee to non-members, $2.50.* Miss Rusk.

**A37. Lilacs in Flower.**—*Four Tuesdays, 4:45 to 6 p.m., May 2, 9, 16, and June 6, and one Thursday* to be arranged. Five outdoor lessons. The comprehensive collection of the Garden affords opportunity for the study of about twenty species and some two hundred of the finest varieties of lilacs. In the last lesson, culture and propagation are taken up; cuttings, which become the property of those taking the course, are prepared for rooting. *Fee to nonmembers, $2.* Dr. Gundersen, Mr. Free, Miss Clarke.

**A44. Gardens within a Garden.**—*Seven Tuesdays, 4 p.m., April 11, 18, 25, May 2, 16, 23, and June 6.* A series of trips in the Botanic Garden, designed especially for Members of the Garden and of the Institute, to enable them to become acquainted with the general plan of the Botanic Garden and the nature of the various special gardens, as well as to see the various floral displays when they are at their best. The schedule of individual trips will be announced later. *No fee.* Dr. Graves and others.

## FLOWER DAYS

To afford an opportunity to members to see the various floral features of the Garden and the special outdoor collections when they are at their best, the following "Flower Days" have been observed, and will be held according to postcard announcements. Each event will be in charge of a specialist on the particular flower concerned.

| | |
|---|---|
| Apple and Cherry Blossom Day. | Dr. Reed. |
| Lilac Day. | Dr. Gundersen. |
| Iris Day. | Dr. Reed. |
| Wild Flower Garden Day. | Dr. Svenson. |
| Annual Rose Garden Day. | Mr. Free, Mr. Tilley. |
| Fall Rose Garden Day. | Mr. Free, Mr. Tilley. |
| Herb Garden Day. | Mr. Free. |
| Chrysanthemum Day. | Mr. Free. |

## B. Courses for Teachers

These courses have been accepted by the Board of Education of New York City for "in-service credit," one credit being granted for each 15 hours (with the exception of "B8, Plant Culture").

Through an agreement with Long Island University, undergraduate credit for certain courses will be allowed toward fulfilling the requirements for a university degree, provided the admission requirements at the University and the laboratory requirements at the Botanic Garden have been fulfilled. Such courses are starred (*). By special arrangement with the institution concerned, these credits have also been used as undergraduate credits in other colleges and universities. Long Island University students desirous of electing any of these or of the other courses should notify Dean Tristram W. Metcalfe or Dr. Ralph H. Cheney, who will give the candidate a card entitling him to admission to the course. The student should present this card at the beginning of the first session of the course.

**B2. Projects for the Activity Program.**—*Fifteen Thursdays, 4 p.m., beginning October 7.* Nodal centers of interest in the field of plant life will be chosen to work out in the laboratories and greenhouses, such as can be carried out in the classroom with groups of students. Two credits. *Fee to non-members, $5; to members, $2 laboratory fee.*

Miss Shaw, Miss Hammond, Miss Carroll.

**B3. Elements of Horticulture and Gardening.**—*Thirty Wednesdays, 4 p.m., beginning September 22.* For teachers only. This course is especially recommended by the Board of Education. Garden work outdoors and in the greenhouse. Taking up plants, making cuttings, propagation by different methods, study of soils. How to plan the Victory garden; raising seedlings. Limited to 60. Two credits. (No students admitted for a half-year of work.) *Fee to non-members, $8 (including laboratory fee); to members, $5 laboratory fee.* Miss Shaw, Miss Dorward.

**B5. Garden Practice.**—For teachers only. Offered as Nature-Garden Science, in conjunction with the Board of Education. For details see Board of Education Announcement of Courses.

Mr. Marvin M. Brooks, Miss Shaw, Miss Miner.

**B7. Greenhouse Work.**—*Thirty Tuesdays, 4 p.m., beginning October 5.* Designed for those teachers who have completed B3 to continue study of indoor culture of plants. Lectures, demonstrations and practical greenhouse work on propagating and growing many different types of flowering and foliage house plants.

Two credits. *Fee to non-members, $8 (including laboratory fee); to members, $5 laboratory fee.* Miss Dorward.

**B8. Plant Culture.**—*Twenty Thursdays, 4 p.m., beginning October 21.* A course for those who have completed B3 and B7. All work is done in the greenhouses. No Board of Education credit. *Fee to non-members, $8 (including laboratory fee); to members, $5 laboratory fee.* Miss Shaw, Miss Dorward.

***B10. Wild Flowers and Ferns: Field and Laboratory Study.**—*Thirty Thursdays, 4 to 6 p.m., beginning September 23.* Same as course A18. See p. 216. Four credits. *Fee to non-members, $8 (including laboratory fee); to members, $3 laboratory fee.* Miss Rusk.

***B13–14. Trees and Shrubs of Greater New York.**—*Twenty Saturdays, 2:30 p.m., October 2 to December 4; and April 15 to June 17, 1944.* Two-hour sessions. A course of outdoor lessons in the Botanic Garden and in the parks and woodlands of Greater New York, the principal object being to learn to know the common trees and shrubs, both native and naturalized, of the eastern United States, which are well represented in this region. The species are considered in systematic order, in both winter and summer conditions, and the outstanding features pointed out by which they may most easily be recognized. Two credits. *Fee to non-members, $6.* Dr. Graves.

## C. Children's Courses

More than thirty separate courses are given Saturday mornings for boys and girls from eight to nineteen years old in the spring, fall, and winter. Miss Shaw and Assistants.

**I. Fall Course.**—*Ten Saturday mornings, 9–11:15, October 16 to December 18.* Nature study on the grounds; plant propagation in the greenhouse, using stem and leaf cuttings; bulbs and corms; making of terrariums and dish gardens. Enrollment limited to 175. *Fee, fifteen cents for the course.*

**II. Winter Course.**—*Six Saturday mornings, 9–11:15, January 15 to February 19.* Children who have shown unusual ability are chosen from the fall group for early winter work. Group limited to 50. *No fee.*

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* See p. 212.

**III. Spring Course.**—*Seven Saturday mornings, 9–11:15, February 26 to April 8.* Nature study and preparation for the outdoor garden, including studies of seed germination, seed sowing in the greenhouse, and the making of garden plans. Enrollment limited to 200. *Fee, fifteen cents for the course.*

**IV. Outdoor Garden Course.**—*Begins April 22.* The outdoor garden is open throughout the summer season, and time is arranged to fit in with children's vacation schedules. No child is assigned an outdoor garden who has not had the spring preparatory work. Group limited to 200 children. *Fee, twenty-five or thirty-five cents, depending on the size of the garden.*

### D. Courses for Special Groups

**D1. Medicinal Plants for Nurses-in-Training.**—*Hours to be arranged.* A course given in both spring and fall, arranged in cooperation with various hospitals. Outdoor trips in the Botanic Garden and trips in the greenhouse to see officinal plants and tropical food plants. Lectures on the care of flowers and plants in the sick room, and demonstrations of some of the major principles governing the life of plants. *No fee.* Dr. Graves.

**D2–3. Trees and Shrubs: Spring and Fall Courses for Employees of the Park Department.**—To be arranged on request. Dr. Graves, Mr. Doney.

**D4. Gardening: for Employees of the Park Department.**—To be arranged on request. Mr. Free.

### E. Investigation

#### 1. *Graduate Work for University Credit*

By the terms of a cooperative agreement between New York University and the Brooklyn Botanic Garden, properly qualified graduate students may arrange to carry on independent investigations in botany at the Garden under the direction of members of the Garden Staff, who are also officers of instruction in the Graduate School of the University. The advantages of the library, laboratories, herbarium, and collections of living plants at the Garden are freely at the disposal of students registered at New

York University for such work. Such properly enrolled graduate students are charged no additional fees by the Garden.

Research work in botany presupposes a knowledge of plants obtained from a study in field and laboratory. Prerequisites include college courses along such lines as morphology, physiology, taxonomy, and genetics. Bacteriology and mycology are special prerequisites for E6. For E8, plant pathology and basic training in forestry are also required.

**E6. Research in Mycology and Plant Pathology.** Dr. Reed.

**E8. Research in Forest Pathology.** Dr. Graves.

**E9. Research in the Systematic Botany of the Flowering Plants.** Dr. Svenson.

**E10. Research in the Structure of Flowers.** Dr. Gundersen.

### 2. *Independent Investigation*

The facilities of the laboratories, conservatories, library, and herbarium are available to qualified investigators who wish to carry on independent researches in their chosen field of botany. By "qualified investigators" is meant those who have obtained the doctor's degree or have completed most of the requirements for the doctorate. The laboratories are open for such use only during the hours when the Laboratory Building is regularly open, viz. 9 a.m.–5 p.m. Mondays to Fridays; 9–12 a.m. Saturdays, except on holidays, when the building is closed. There is a charge of $25 per year, payable to the Botanic Garden.

## COOPERATION WITH LOCAL SCHOOLS

The Brooklyn Botanic Garden aims to cooperate in every practicable way with the public and private schools of Greater New York in all matters pertaining to the study of plants and closely related subjects.

Geography classes, as well as classes in nature study and botany, find the collection of useful plants in the Economic Plant House, the Local Flora Section, the Herb Garden, and also the Meridian Panel, the Armillary Sphere, and the Labeled Glacial Boulders, valuable adjuncts to their class work. Illustrated lectures at the Garden for geography classes may be arranged.

To visiting college classes in geology and physiography the Botanic Garden offers interesting material for a study of glaciation. Notable features are a portion of the Harbor Hill terminal moraine (Boulder Hill), the morainal pond (the "Lake"), the labeled glacial boulders, and the Flatbush outwash plain. See Guide No. 7, *"The Story of our Boulders: Glacial Geology of the Brooklyn Botanic Garden."*

**Talks at Secondary Schools and Colleges.**—Informal illustrated talks on various subjects of an advanced botanical nature are always gladly given at Secondary Schools and Colleges by members of the staff. Arrangements for such talks should be made with the *Curator of Public Instruction.*

**School Classes at the Garden.***—Public or private schools, both elementary and secondary, may arrange for classes to come to the Botanic Garden for illustrated lectures by a member of the Garden staff, or for guided tours of instruction through the conservatories and outdoor plantations.

Visiting classes must be accompanied by their teachers, and notice of such visits should be sent at least one week in advance. Blank forms for this purpose are provided by the Garden. Lists of talks and trips offered will be sent on request: for Junior High and Elementary Schools address the *Curator of Elementary Instruction;* for High Schools, the *Curator of Public Instruction.*

**Seeds for School and Home Planting.**—Penny packets of flower and vegetable seeds are put up by the Botanic Garden for children's use. In the early spring, lists of these seeds, order blanks for teachers and pupils, and other information may be secured on application to the *Curator of Elementary Instruction.*

**Demonstration Experiments.**—Teachers may arrange to have various physiological experiments or demonstrations conducted at the Garden for the benefit of their classes. Communications in regard to these matters should be addressed to the *Curator of Public Instruction.*

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* Visits to Botanic Gardens and Museums by Public School classes have been generally discontinued by the Board of Education for the duration of the war. Visits by classes from Private Schools and Colleges will be scheduled in harmony with existing regulations.

**Loan Sets of Lantern Slides.**—Sets of lantern slides have been prepared for loan to the schools. Each set is accompanied by a short lecture text of explanatory nature. In all cases these sets must be called for by a responsible school messenger and returned promptly in good condition. Address, by mail or telephone (Main 2-4433), Mr. Frank Stoll, *Custodian.* The subjects now available are as follows. Other sets are in preparation.

1. Plant Life
2. Common Trees
3. Forestry
4. Soil Conservation
5. Conservation of Native Plants
6. Spring Wild Flowers
7. Summer Wild Flowers
8. Fall Wild Flowers
9. Ferns and Fern Allies

**Study and Loan Material for Elementary Schools.**—To the extent of its facilities, the Botanic Garden will provide, on request, various plants and materials for nature study. Requests from Elementary Schools should be made to Miss Elsie T. Hammond, and material should be called for at the Information Booth on the ground floor.

## Study and Loan Material for Colleges, High Schools, and Junior High Schools

The Botanic Garden is able to supply botanical material for study. Geraniums, coleus, tradescantia, bryophyllum, sedum, mimosa, and various fungi, liverworts and ferns may be available. Some material illustrating genetics may be furnished, for example, sorghum seeds for growing $F_2$ seedlings showing red and green seedling stem characters with three to one ratios; others giving normal green and albino seedlings; pea seeds of tall and dwarf strains. Sterilized agar in Petri dishes may be furnished. Cultures of molds and paramecia may be available. Specimens and mounts for exhibit are also available.

A small charge for the material supplied or loaned is made. A Price List of the various materials furnished will be mailed on request.

## BUREAU OF PUBLIC INFORMATION

Consultation and advice, and the facilities of the library and herbarium are freely at the service of members of the Botanic Garden and (to a limited extent) of others with special problems relating to plants or plant products, especially in the following subjects:

1. The care of trees, shrubs, and lawns.
2. The growing of cultivated plants and their arrangement; also their adaptation to soils, climate, and other factors.
3. Determination (naming) of flowering plants.
4. Plant diseases and determination of fungi.
5. Plant geography and ecology.

Inquiries should be directed to the *Curator of Public Instruction,* preferably by letter.

**Determination of Specimens.**—If the identification of plants is desired, the material submitted should include flowers, and fruit when obtainable. Identification of a single leaf is often impossible. For identification of plant diseases, representative portions of the part diseased should be sent.

**Demonstration Victory Gardens,** 20′ × 40′ and 10′ × 20′, installed at the south end of the Esplanade, are designed to be helpful to beginners in the planning and spacing of crops in their own vegetable gardens. The plantings are arranged to get the greatest amount of vegetables from limited areas by means of "companion" and "succession" cropping. For example, lettuce and spinach are planted between tomato rows because they mature quickly and can be harvested before the tomatoes require the space—*companion cropping;* snap beans are planted to follow beets; carrots follow early cabbage—*succession cropping.* The approximate dates of planting are indicated on the labels, and a supplementary label, with date, is inserted when the crop is removed. The basic spacing of the rows in the larger garden is eighteen inches, and in the small garden fifteen inches. In addition to the above, a plot 22′ × 22′ accommodates a collection of vegetables not included in the model gardens either because they demand too much space for the amount of food produced—e.g., corn, squash; because they are difficult to grow in the city—cauliflower, eggplant; or because they are of lesser importance—mustard greens, okra, etc.

## DOCENTRY

To assist members and others in visiting the plantations the services of a docent may be obtained. Arrangements should be made by application to the *Curator of Public Instruction* one week in advance. No parties of less than six adults will be conducted. This service is free of charge to members and accompanying friends; to others there is a charge of 50 cents per person. For information concerning membership in the Botanic Garden see pages —— of this PROSPECTUS.

## EXTRA-MURAL LECTURES

With the exception of talks to schools, the Botanic Garden does not officially schedule members of its personnel for lectures or talks outside the Botanic Garden, except for lectures on the Garden itself or some aspect of its work. In such cases no fee is charged beyond traveling expenses.

## MEETINGS OF OUTSIDE ORGANIZATIONS

The Brooklyn Botanic Garden is glad to welcome outside organizations wishing to hold meetings at the Garden, provided the general purpose of the organization is closely allied to that of the Botanic Garden (e.g., Botanical Groups, Garden Clubs, Nature Study Clubs, Conservation Organizations, etc.), or that the specific purpose of the meeting is of mutual interest and advantage to the organization and the Botanic Garden. Meetings must always be arranged for in advance. A folder giving full details, and an application blank may be had by addressing *The Custodian.*

## PLANTATIONS

The horticultural diversity of the plantations has given them the appropriate name of "Gardens within a Garden." In addition to some eight or ten special collections (e.g., Crocus, Daffodils, Flowering Cherries, Flowering Apples, Tulips, Peonies, Lilacs, Iris, Azaleas and Rhododendrons, Cannas, Hardy Chrysanthemums) the plantations comprise the following gardens:

1. General Systematic Section
2. Wild Flower Garden (Local Flora Section)
3. Children's Garden
4. Oriental Garden
5. Rock Garden
6. Water Gardens
7. Conservatory Garden
8. Laboratory Plaza
9. Shakespeare Garden
10. Horticultural Section
11. Moss Garden
12. Fern Garden
13. Rose Garden
14. Rose Arc
15. Iris Garden
16. Ivy Garden
17. Wall Garden
18. Herb Garden
    *a.* Culinary Herbs
    *b.* Medicinal Herbs
    *c.* Elizabethan Knot Gardens
19. Experimental Garden
20. Nursery

The above collections, all carefully labeled, are, in effect, an outdoor museum of plant life and gardening, and constitute an indispensable basis for our program of scientific work and public education.

## HERBARIA

*The Phanerogamic Herbarium* consists of more than 215,000 specimens of flowering plants, chiefly from North America.

*The Cryptogamic Herbarium* contains approximately 81,000 specimens of fungi and myxomycetes.

These herbaria may be consulted daily (except Sundays and holidays) from 9 a.m. until 5 p.m.; Saturdays from 9 a.m. to 12 m. Specimens may be submitted for identification.

## LIBRARY

The rapidly growing library of the Garden comprises at present about 23,000 volumes and about 21,000 pamphlets. This is not a circulating library, but is open free for consultation to all persons daily (except Sundays and holidays) from 9 a.m. until 5 p.m. (Saturdays, 9 to 12). More than 1,000 periodicals and serial publications devoted to botany and closely related subjects are normally received. These include the transactions of scientific societies from all quarters of the globe; the bulletins, monographs, reports, and other publications of various departments of the United States Government, as well as those of foreign governments, and of all state agricultural experiment stations and agricultural colleges; the publications of research laboratories, universities, botanic gardens, and other scientific institutions of the world, as well as the files of independent journals devoted to the various phases of plant life. The library is specially rich in publications of foreign countries and has a growing collection of incunabula and other pre-Linnaean works.

*The Library of the American Fern Society*, deposited at the Garden as per an *Agreement* executed on April 21, 1930, is also open free daily to the general public for reference, under the same regulations as govern the main library.

Bibliographical assistance is rendered to readers by members of the Library staff.

An annotated list of the incunabula, pre-Linnaean works, old herbals, and other rare or historically important books in the Library was published as the July, 1935, number of the Botanic Garden RECORD. Copies are for sale at 40 cents each, post free.

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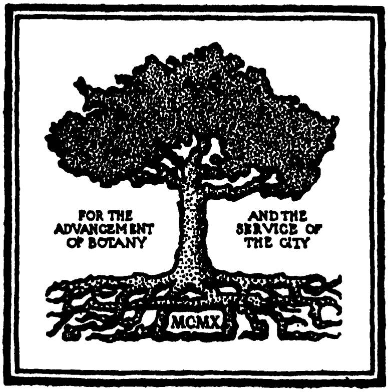
# BROOKLYN BOTANIC GARDEN RECORD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BROOKLYN BOTANIC GARDEN RECORD

VOL. XXXIII JANUARY, 1944 NO. 1

# THIRTY-THIRD ANNUAL REPORT OF THE BROOKLYN BOTANIC GARDEN

# 1943

## REPORT OF THE ACTING DIRECTOR[1]

To the Botanic Garden Governing Committee:

I have the honor to present herewith the Thirty-third Annual Report.

The death of Dr. C. Stuart Gager on August 9, 1943, the Director of the Botanic Garden since its founding in 1910, was a very great loss to the institution. By his efforts for more than thirty-three years he shaped and guided its destinies and built up a Garden which has won world wide recognition for its research, contributions to botanical education, and the beauty of the grounds, combining a museum of living plants with special features such as the Children's Garden, Oriental Landscape Garden, Rose Garden, Rock Garden, Herb Garden, Medicinal Plant Garden, and Local Flora. His achievements are a monument to his vision of what a Botanic Garden should be.

**The Victory Garden Movement.**—The Botanic Garden has taken an active part in furthering the planting of Victory Gardens. Special courses of instruction were given in the spring and in the fall. In the spring a course on *Fundamentals of Gardening: The Flower Garden* (V8) by Miss Shaw, Miss Dorward, and Miss

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[1] The illustration on the front cover page shows the Tropical Lily Pool and its situation with reference to the Laboratory Building. *Victoria regia*, in bloom, is shown in the foreground.

Clarke, had a registration of 28 students; a course on *Gardening for Food and Vitamins* (V10) by Mr. Free, a registration of 30; and two courses on *Gardening for Victory* (V11, V12), by Mr. Free and Miss Dorward, an enrollment of 53. One session was devoted to "*Information Please*," in which Mr. Free answered questions concerning gardening problems. There was a series of six guided tours through the conservatories on *Tropical Plants Important in the War Effort* (V22) by Dr. Graves, Dr. Gundersen, Miss Rusk, and Miss Ashwell; a series of four lectures on *Useful Plants* (V7) by Miss Dorward, Miss Rusk, Dr. Svenson, and Dr. Graves; a course of four lectures on *Gardening for Beauty* (V6) by Mr. H. R. Sebold, associate in Landscape Architecture, Columbia University, Mr. Doney, Miss Carroll, and Miss Clarke; and a course on *Spring Garden Work* (V9) by Miss Dorward.

In the fall a course on *Your Garden This Fall* (V1), and one on *House Plants* (V4) were given by Mr. Free. Mrs. H. K. Svenson gave one demonstration on *Jellies, Jams, and Preserves* (V13), assisted by Mrs. Martin Wifholm of Boston, an expert in home canning and preserving.

A series of three lectures on timely subjects was given on Mondays in March. Mrs. Esther Robertson Hallock, Instructor in Home Economics at Pratt Institute, Brooklyn, and at the Ballard School, Manhattan, gave a lecture-demonstration to an audience of about 150 on *The Preservation of Wartime Foods.*

Mrs. Stella Blanche Brevoort, formerly Instructor in Home Economics in New York University, gave a discussion on the history of weaving and making of textiles in a lecture *From Eve to Dupont.*

Miss Florence E. Wall, Consulting Chemist, New York City, and Lecturer in Cosmetology, New York University, outlined the history of cosmetics from ancient times in a lecture *Plants in Cosmetics—from Ancients to Moderns.* About 100 people attended.

Exhibits of material relating to each of these lectures were installed in the Rotunda.

**Cooperation with the New York Victory Garden Council and C.D.V.O.**—From March 15 to September 7 Dr. L. Gordon Utter gave his full time to the Victory Garden Council, devoting most of it to garden activities in Brooklyn, in cooperating with the Garden Section of the C.D.V.O. under the direction of Mrs. John C. Parker. Dr. Utter visited various sections in Brooklyn, giving instruction and advice on the planting and care of the gardens. Considerable time was spent in the main office of the New York Victory Garden Council answering requests for information by telephone. Forty talks were given before various organizations on timely garden subjects, the total attendance at these being approximately 5,600.

In the Victory Garden course at Bloomingdale Bros. Inc. Miss Shaw and Miss Dorward gave two series of lectures.

**Conservatory Exhibits.**—A series of monthly exhibits was installed in the conservatories during the months of January, February, and March entitled *Plants Important in the War Program*, as follows:

| | |
|---|---|
| January: | Rubber-yielding plants. |
| February: | Fiber, resin, cork, and gum plants. |
| March: | Beverage plants. |

**Demonstration Victory Gardens.**—Two Victory Gardens were planted on the south end of the Esplanade, one 20 feet by 40 feet and the other 20 feet by 10 feet. In addition, a collection of vegetables was grown. In the Experimental Field 30 plots averaging about 450 square feet each were assigned to employees, who tended them after Garden hours and produced good crops of vegetables. On September 23 and 24 a Victory Garden Harvest Show of produce from the victory gardens, children's gardens, and employees' gardens was held in the rotunda of the Laboratory Building. Prizes of war stamps were awarded to Natalie Bowen, Alys Sutcliffe, Henry Funk and Anton Hubert.

**Motion Pictures of Victory Gardening.**—A showing of sound films on Victory Gardening, released by the British Information Services, was given on April 20 in the auditorium of the Laboratory Building, the films illustrating the following topics: 1. Dig for victory; 2. How to dig; 3. Sowing and planting; 4. Storing vegetables indoors. The attendance was about 500.

**Annual Spring Inspection and Flower Days.**—The Twenty-ninth Annual Spring Inspection of the Garden was held on May

11 and was attended by 450. The tour of the grounds included the Culinary Herb Garden, Cherry Walk, the Model Victory Gardens and the large planting of Poet's narcissus.

The exhibit in the building stressed the scientific basis of hybrid corn production, as well as the improvement in varieties of vegetables. Dr. George H. Shull, Professor Emeritus of Princeton University, who laid the scientific foundation for hybrid corn production in 1905–1909, honored us by his presence and courteously answered questions asked by those interested. It may be noted that it was approximately twenty years later before the practical application of the scientific data was made on a large scale. This is a fine illustration of the time lapse which may occur with important scientific discoveries and their final utilization in every-day life.

Three Flower Days were observed. On Tuesday, June 22, the Sixteenth Annual Rose Garden Day was attended by about 100 members and guests. Mr. F. F. Rockwell, Garden Editor of the *New York Times*, spoke on *Roses*. The tour of inspection of the Rose Garden was conducted by Mr. Free and Mr. Tilley.

On Tuesday, October 5, Fall Rose Garden Day was held, Mr. S. R. Tilley speaking on *Putting the Roses to Bed.* About 50 persons were present at the lecture and inspection of the Garden.

On Friday, November 5, Chrysanthemum Day was observed. For the benefit of those who attended there was a preview of a special display of greenhouse-grown chrysanthemums, which was opened to the public on the following day. Members of 12 Brooklyn garden clubs received special invitations to participate and to meet the Botanic Garden staff. About 150 persons were present and listened to a talk on the *Story of the Chrysanthemum* by Mr. Montague Free. Miss Hilda Loines, Chairman of the Governing Board, presided.

The social part of the Spring Inspection and Flower Days was in charge of the entertainment committee of the Woman's Auxiliary of the Garden, Mrs. Edwin H. Thatcher, Chairman, and we are pleased to have the opportunity of acknowledging our indebtedness to this organization.

**War Bond Rally.**—A rally to enlist volunteers to aid in the Third War Loan Drive was held in the auditorium of the Laboratory Building on August 31. This meeting was conducted by the Women's Division of the Kings County Welfare Committee of the War Savings Staff of the U. S. Treasury Department. The meeting was arranged for by Mrs. Thomas Sturgis, and was attended by over 400 people.

**Sale of Defense Stamps and Bonds in the Garden.**—The Kings County War Savings Staff, as in 1942, sold Defense Stamps and Bonds in the Garden on Sundays throughout the summer, beginning on May 23 and ending on October 2. The sales totaled $958.65. Mrs. J. Shapiro, Chairman of Booths, Women's Division, was in charge.

**Woman's Auxiliary.**—The Auxiliary gave to the Garden the sum of $500.00, $300.00 of which was applied to the new planting of 76 flowering cherry trees on the Esplanade.

**Cooperation with Other Institutions.**—In the reports on Research, mention is made of cooperation with other institutions, including the Division of Cereal Crops and Diseases and the Division of Forest Pathology of the United States Department of Agriculture. In the report of the Curator of the Herbarium the reciprocal loans of specimens for study are noted. From the Mycological collection two type specimens were loaned to Dr. Anna E. Jenkins, Division of Mycology and Disease Survey, Bureau of Plant Industry Station, Beltsville, Md., and specimens of Porto Rican fungi to Prof. H. H. Whetzel, Department of Plant Pathology, Cornell University.

The Garden is building up its collection of flowering crab apples and ornamental cherries. With this in view, cions have been obtained from the Arnold Arboretum, Mr. Richard E. Horsey of Highland Park, Rochester, N. Y., Mr. B. Y. Morrison, Bureau of Plant Industry Station, Beltsville, Md., N. Y. State Institute of Agriculture, Farmingdale, N. Y., and Mr. John C. Wister of the Arthur Hoyt Scott Horticultural Foundation, Swarthmore, Pa.

In connection with iris hybridization studies, Prof. A. F. Blakeslee, Smith College, Northampton, Mass., gave active cooperation.

**Contributions of Plants.**—About 100 surplus conservatory plants were supplied for a greenhouse in the Brooklyn Navy Yard. Eighty-two trees and shrubs were given to beautify the grounds of the Halloran General Hospital, Staten Island. Nine trees, 4 vines and about 100 perennials were sent to the Navy Hospital on Staten Island. Flowers were provided for the recreation hall of the U. S. Coast Guard. A demonstration of tree pruning for the purpose of providing practice in motion picture photography was given to members of the Signal Corps, U. S. Army. A considerable number of shrubs and trees and bearded iris was given to Queens College.

Plant material was supplied to the Brooklyn Museum for a Chinese exhibit, and to the United China Relief, Inc., for the Chinese Pavilion at the Women's International Exposition at Madison Square Garden. A model "Doll's Garden" was prepared for the Anniversary Celebration of the Children's Museum.

**Seed Packets for School Children.**—Over a million and a quarter packets of seed were distributed: a great help to children's home Victory Gardens.

**Volunteer Workers.**—The various activities of the Garden have been greatly aided by the voluntary services of a number of individuals. In the Department of Elementary Instruction the following rendered assistance: Mrs. B. Baigel; Mrs. I. O. Becher; Mrs. G. Bernstein; Miss Bertha Blau; Miss Elma Edson; Mrs. Benjamin Davidson; Mrs. George Gordon; Miss Ellen Gundersen; Mrs. Oscar Kaye; Miss Ethel Hallaren; Miss Helen Mattin; Mrs. H. Nalib; Mrs. M. Oren; Mr. Harold Quoyoon; Miss Cora Reed; Mrs. Harry Schiff; Miss Charlotte Slawson; Miss Agnes M. Shaw; Mrs. N. T. Steeves; Mrs. I. Waldes; Mrs. E. H. Weissberger. During the summer five elementary school teachers each gave a week's service, authorized by the Board of Education.

In the Department of Pathology, Mrs. M. Oren assisted in the field and laboratory work. Miss Zina Kiziuta, a student of Cornell University, spent the month of June attempting a large number of crosses between different iris species.

In connection with the American Fern Society herbarium, Mrs. Herbert Lawrence again assisted.

Mr. John Coates (assigned to the Department of Elementary Instruction) worked 84 days as a volunteer gardener.

**Publication.**—Two illustrated Guides to the Garden collections have been published:

*Guide No. 15. The Herb Garden of the Brooklyn Botanic Garden*, published in the January number of the *Record*. In Part 1 Miss Elizabeth Remsen Van Brunt, Honorary Curator of Culinary Herbs, describes *Culinary Herbs: Their Culture, Traditions, and Use*. In Part 2 Mrs. Virginia Riddle Svenson, of the Department of Home Economics of New York University, in *Cooking with Herbs*, gives recipes for using forty-five of the culinary herbs growing in the Brooklyn Botanic Garden.

*Guide No. 16. The Medicinal Plant Garden of the Brooklyn Botanic Garden* was published in the July number of the *Record*. There is a *Foreword* by Dr. C. Stuart Gager, *A Brief Historical Survey of the Use of Plants in Medicine* by Dr. Arthur Harmount Graves, *Medicinal Uses of Drug Plants Cultivated in the Medicinal Plant Garden of the Brooklyn Botanic Garden* by Professor C. W. Ballard, Dean, College of Pharmacy, Columbia University, with the collaboration of Dr. Ralph H. Cheney, Resident Investigator, Brooklyn Botanic Garden, Chairman, Biology Department, Long Island University, and Prof. F. J. Pokorny, College of Pharmacy, Columbia University, and Mr. William E. Jordan, Librarian, gives *A Short List of the Books in the Library of the Brooklyn Botanic Garden Dealing with the Early Use of Plants in Medicine.*

**The Library.**—The Librarian reports that 153 volumes were purchased, gifts during the year including 81 volumes, 372 pamphlets, and 936 parts. Of periodicals and other serials, 488 were received as exchanges, 90 as gifts, 99 as purchases, and 5 through publication. Loans to other institutions totaled 32 items.

**Herbarium.**—There were added to the Phanerogamic Herbarium 1112 specimens by exchange, 875 by gift, 8 by collection, and 301 by purchase. One fern specimen was received as a gift. 2,105 specimens were added to the Mycological Herbarium.

**Personnel.**—*Mr. Andrew J. Gonnoud* and *Mr. Donald G. C. Sinclair* were elected as new members of the Botanic Garden Governing Committee at the meeting of the Trustees of the Brooklyn Institute of Arts and Sciences on April 9.

*Dr. George M. Reed* became Acting Director of the Botanic Garden as of September 24.

*Miss G. Elizabeth Ashwell* resigned as Curatorial Assistant in the Department of Public Instruction as of July 31.

*Miss Virginia A. Clay*, previously stenographer in the Director's office, was transferred to the Department of Public Instruction as of November 15.

*Miss Jeanne Phyllis Walther*, Research Assistant in Plant Pathology, resigned as of April 30.

**Attendance.**—Due to war time restrictions, the attendance of visiting classes was greatly reduced during the spring months. In the fall, however, there was a return of classes for instruction. The accompanying table records the general attendance of classes during the year.

ATTENDANCE AT THE GARDEN DURING 1943

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| At regular classes | 802 | 1,504 | 3,419 | 3,448 | 3,325 | 4,792 | 17,500 | 19,250 | 2,569 | 2,137 | 2,374 | 1,493 | 62,613 |
| At visiting classes | 162 | 30 | 779 | 2,785 | 10,864 | 3,959 | 48 | 316 | 81 | 820 | 2,582 | 411 | 22,837 |
| At lectures to children | 88 | 20 | 579 | 1,594 | 3,330 | 938 | 14 | 42 | 0 | 620 | 1,464 | 188 | 8,877 |
| At lectures to adults | 50 | 39 | 458 | 242 | 393 | 58 | 25 | 0 | 0 | 108 | 129 | 843 | 2,345 |
| At conservatories | 6,033 | 8,128 | 9,495 | 24,038 | 28,921 | 10,094 | 9,908 | 10,513 | 13,633 | 9,463 | 15,371 | 6,981 | 152,578 |
| At grounds | 65,254 | 88,383 | 87,665 | 177,712 | 258,358 | 155,114 | 133,398 | 126,598 | 131,095 | 96,945 | 100,325 | 44,943 | 1,465,790. |

For 1942 the figures for total attendance were 1,660,046, while for 1943 they were 1,465,790.

Attendance in both visiting classes and regular classes showed an increase of 17,549 and 8,357 persons respectively.

**Financial.**—A list of the gifts of funds, publications, plants, and other objects may be found on pages 33–38. These have all been acknowledged as received.

The total operating budget for the calendar year 1943 was as follows, with comparison for 1942:

| | *1943* | *1942* | *Change* |
|---|---|---|---|
| Tax Budget (47.20%)............ | $ 96,324.66 | $ 91,830.67 | +$ 4,493.99 |
| Private Funds (52.80%).......... | 107,581.85 | 94,099.09 | + 13,482.76 |
| Totals...................... | $203,906.51 | $185,929.76 | +$17,976.75 |

The Tax Budget shows an increase of $4,493.99. This is due largely to the increase in salaries and wages of employees in the salary range $1,200 to $2,500.

The Private Funds Budget shows an increase of $13,482.76. This is due largely to extra income from interest received on investments.

**Improvement in Salaries and Wages.**—In consideration of the rising cost of living, the sum of $3,720.00 was appropriated by the City of New York on July 1, 1943, to provide for an increase of $120.00 a year for employees in the salary range of $1,200.00–$1,800.00 and an increase of $180.00 a year for employees in the salary range of $1,800.00–$2,500.00. Also the wages of the per diem men were increased by $.50 per day, which made a total increase in wages of $2,496.00

The above increases for both salaries and wages were approved for the year 1943–1944 only.

This Annual Report is briefer than those published in recent years but we believe that it includes an adequate summary of the Garden's activities for 1943.

It is planned to devote the April number of the *Record* as a special memorial to Dr. Gager.

Respectfully submitted,

GEORGE M. REED,
*Acting Director.*

## REPORTS ON RESEARCH FOR 1943

### PLANT PATHOLOGY

BY GEORGE M. REED

*Physiologic Races of the Oat Smuts.*—The problem of developing new resistant varieties of useful plants is complicated by the existence of physiologic races of the pathogens. In recent years the Victoria oat variety, introduced from South America, has been used extensively in oat-breeding work and has proved particularly valuable because of its high degree of resistance to known races of both loose and covered smuts. Victoria has been crossed with other varieties and, from the hybrids, selections have been made, some of which are well adapted to the Northern oat-growing region, while others are suitable as winter oats in the South. However, new races of smut have been discovered which attack Victoria and many of the most desirable selections derived from the crosses in which it was one of the parents. In most of these cases both of the original varieties used in crossing were susceptible to the new races. In some cases, however, resistant selections have been obtained from hybrids in which Victoria has been crossed with a variety resistant to the new races, and among the latter are some of the outstanding recently introduced varieties of oats for the North, such as Vicland in Wisconsin and adjacent States.

Investigations on the resistance of newly developed varieties of oats and the discovery of new races of oat smuts have resulted from cooperation with Mr. T. R. Stanton, Senior Agronomist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, Beltsville, Md., and Dr. George J. Wilds, Coker's Pedigreed Seed Co., Hartsville, S. C.

*Studies on the Inheritance of Oat Smut Resistance.*—As reported last year, experiments were conducted with second generation plants of hybrids involving Victoria and Monarch, inoculated with Race 1 of the covered smut, to which Victoria is resistant and Monarch is susceptible, the data secured indicating a single factor for resistance. During the past year 200 third generation progenies were grown and the data obtained confirm the conclusion that one resistant factor differentiates the two parental varieties.

The second generation plants of 32 additional crosses were tested with definite physiologic races of smut. The parental varieties of these hybrids varied in their reaction to the races used. In some cases the data indicate a single factor difference while in others two or more factors seem to be involved.

The first generation plants of 32 later crosses were grown. The original hybridizing had been done by Miss Jeanne P. Walther in 1942. The parental varieties used in these crosses differed in their reaction to known physiologic races, and the data on the behavior of the second generation of the hybrids will be obtained during the coming year.

## CHESTNUT BREEDING WORK IN 1943

### BY ARTHUR HARMOUNT GRAVES

This project has been fully explained in previous reports, but for those who are unacquainted with it I might say briefly that by breeding and selection we are endeavoring to develop a new chestnut stock which shall be of tall timber type and at the same time immune (or as nearly so as can be) to the dread blight which has killed off practically all chestnut in its natural range in the eastern U. S.

*Breeding Work in 1943.*—Since the report of this year's work must be brief, I shall say only that the crossing of our hybrids with each other and back crossing of them with resistant Japanese and Chinese individuals has gone on as usual. In early October we gathered 365 nuts, presumably all of hybrid nature, from these crosses. Most of these have been planted in pots in cold frames at the Hamden plantation, but a few are in the Garden cold frames.

*Inarching of Basal Shoots of Hybrids.*—We have continued the practice, explained in my report for 1941, of keeping our F1 hybrids in a vigorous condition by inarching the basal shoots, thus bridging over lesions caused by the blight fungus. Nearly all of the grafts of this sort made this spring were successful, so that we have on hand a good supply of fine breeding stock.

*Hybrids of 1942.*—This year the young trees resulting from the hybrid nuts of 1942 were set out according to pedigree in a special nursery: that is, the trees resulting from each particular cross (called, technically, "sibs") were planted in sequence in the rows in order that their behavior might be compared. Of these seedlings I selected at the end of the season, in mid-September, about 50 trees which had attained a growth of 2 feet or more, and the remainder, about 225, were shipped to the Division of Forest Pathology at Beltsville, Maryland, where they are to be set out in a good location. The 50 trees that I have kept will be tested for disease resistance by the inoculation method, and the most resistant will be used for further breeding.

*American Seedlings.*—About 300 one- and two-year-old seedlings of American chestnut were set out in another nursery. These were grown from nuts received from various places in the Eastern States (see reports for 1941 and 1942). This winter these seedlings were covered with brush, an apparently effective way of preventing rabbits from shearing them off. The hybrid seedlings of 1942 were protected from rabbits by a fence of wire netting, and from pine mice by a border of wire netting sunk one foot deep in the ground.

*Inoculations for Testing Disease Resistance.*—In cooperation with the Division of Forest Pathology, U.S.D.A., we started during the summer another series of inoculations—about 250 in all, to test the disease resistance of our hybrids. A detailed report of this work must be postponed for the present.

*Studies of Disease Resistance.*—The ultimate cause of blight resistance in some species and individuals and of susceptibility in others has never been determined. It appears quite likely that it is related to the relative degrees of sap concentrations in the cells of the host and parasite. This hypothesis is not new, but was put forward by Dr. A. P. Kelley, of Landenberg, Penna., in *Science* for March 22, 1940. With the cordial cooperation of Dr. E. W. Sinnott and the staff members of the Osborne Botanical Laboratory at Yale University I spent some time at the laboratory during the summer in studying this problem. The work will be continued in 1944.

*Cooperative Plantations.*—The plantation of Chinese and Chinese hybrids at Litchfield on land of the White Memorial Foundation was visited several times during the summer, and now, thanks to the interest and cooperation of Mr. Clifford Ongley, superintendent, the plantation is in a thrifty condition. Our chief enemy has been the deer, but the details of the situation will be presented in a later report.—In the plantation of hybrids on land of Mr. Archer M. Huntington at Redding Ridge, Conn., which has been started through the cooperation of Dr. D. F. Jones, Geneticist of the Conn. Agricultural Experiment Station, New Haven. Conn., there have been some fatalities due to the cold winter of 1942–3, but when these trees get established in their new locations they should contribute in many ways to the success of our project.—At the plantation of Dr. W. W. Herrick, of Sharon, Conn., a considerable number had died also from the effects of the cold winter.

*Acknowledgments.*— Pollen of the American chestnut was received from Mr. E. J. Grassmann of Elizabeth, N. J., on July 3; and from Mr. John A. Colin, New York City, from Millhurst, N. J.

We received in February, 6 trees of *Castanea mollissima*, variety Hobson, from Mr. James Hobson of Jasper, Florida; in March and April, 2 lots of *C. alnifolia* seedlings from Mr. Joseph C. MacDaniel, Monticello, Florida.

Nuts for planting were received as follows:

September. American chestnut from Mrs. Arthur Manzo, New York City, from Old Lyme, Conn.; Japanese chestnut from Mr. Oscar R. Wallace, New York City, from Sunken Meadow Park, Kings Park, L. I.

October. *Castanea pumila* x *C. crenata*, hybrids of American chinquapin and Japanese chestnut, from Dr. A. S. Hitchcock, Boyce Thompson Institute, Yonkers, N. Y.; American chestnut from Mr. F. Gregg Bemis, Boston, Mass., Mr. L. Wolcott, Kennett Square, Pa., and Mr. H. D. Roschen, Baltimore, Md.

November. American chestnuts from Mrs. F. M. Islieb, East Hampton, Conn.; Mr. W. F. Story, Dunlap, Tenn.; and Mr. C. Howard, Hancock, N. Y.

As in former years, we have enjoyed the cordial cooperation of the Division of Forest Pathology of the United States Department of Agriculture. To the many correspondents, visitors, and donors of nuts, pollen, seedlings and land for carrying on our experiments, we are pleased to have this opportunity of acknowledging our indebtedness for these substantial evidences of their interest in this undertaking.

## FLOWER STRUCTURE AND THE CLASSIFICATION OF DICOTYLEDONS

BY ALFRED GUNDERSEN

During the year studies were made in a number of families including Hamamelidaceae, Magnoliaceae and Caryophyllaceae. Miss Maud H. Purdy added details to a number of earlier drawings.

In July through the favor of Dr. John T. Howell of the California Academy of Sciences we obtained a fresh plant of *Frankenia grandiflora*, of which we had had only dried material. A color study was completed and details of development show many resemblances with the Caryophyllaceae. In particular the bud stage of Caryophyllaceae suggests the adult stage of Frankenia.

About sixty of Miss Purdy's drawings, and some from published figures were combined into two charts to illustrate flower structures in seventy families; these were printed in the September *Bulletin of the Torrey Botanical Club.* In the accompanying article a tentative arrangement of Dicotyledons, in part intermediate between the classic system of Engler and that of Bentham and Hooker is proposed. The nine groups adopted are represented by the genera Magnolia, Betula, Cistus, Malva, Geranium, Myrtus, Dianthus, Fraxinus and Rubia.

## HERBARIUM RESEARCH AND FIELD WORK

BY HENRY K. SVENSON

During the past year the extensive annotated catalogue of plants collected by me in Western Ecuador and Peru has been finished. A report, together with photographs of the region, description of floral areas, and line drawings by Miss Purdy, is ready for publication. The area varies from desert to tropical rain forest often within the distance of a few miles, and therefore represents one of the most remarkable climatic transitions to be found in the world. The cause seems to lie in the drying southerly winds which blow off the cold Humboldt Current during the greater part of the year, and the precipitation of fogs on adjacent mountains lying almost directly on the equator. The region is covered mostly by thorn-bush and grasslands, strikingly similar in appearance to the thorn-bush plains of East Africa.

In collaboration with the Missouri Botanical Garden I completed an extensive account of the Cyperaceae of Panama, published in September, and during the year determined North American and South American Cyperaceae for a number of institutions. I have nearly completed the Cyperaceae for the North American Flora in collaboration with the New York Botanical Garden. Due to travel difficulties no field work has been carried on during the past year.

## REPORT OF THE CURATOR OF PUBLIC INSTRUCTION FOR 1943

TO THE ACTING DIRECTOR:

**Grounds.**—The total attendance on the grounds was 1,465,790, less than last year by 194,256. This drop is not surprising, considering the stringency in transportation facilities and the general changed conditions due to war activities. In his report of last year (*B.B.G. Record* 32: 45) Dr. Gager showed that other public and semi-public institutions of N. Y. City have reported a decrease in attendance—some of these to a much greater extent than at the Brooklyn Botanic Garden.

For one month only the attendance exceeded all past records, namely, February, with an attendance of 88,383. The nearest previous figure was in 1939—86,925. The reason for this record attendance was evidently the unusual warm weather of the Washington's Birthday week-end—the three day period including Monday, February 22. For this week-end the attendance was 37,683, not far from half of the whole February attendance. The thermometer hovered around 60°, and this and the blooming of the snowdrops and oriental witch hazels were the principal reasons for the throngs of visitors.

**Conservatories.**—The yearly attendance at the conservatories —152,578—was much greater than for many years—in fact only once (in 1935, 154,659) has it been exceeded. The exhibits of rubber-yielding, beverage, and fiber plants early in the year, the magnificent display of Chrysanthemums in November, and the blooming of more than 200 Poinsettias in December, as well as the generally improved arrangement of plants in all the ranges, no doubt account for a large part of the increase.

**Classes and Lectures.**—The combined attendance at classes and lectures for children and adults at the Garden was 96,672, a considerable increase over that of last year.

**Adult Courses and Lectures.**—The total registration of adults in our courses for 1943 was 969, a somewhat lower figure than for several years past, due to several causes, but fundamentally, of course, to changes brought about by war conditions. A large factor was the drop in registration of student nurses, who have been coming by the hundreds in past years. The course for nurses, which has now been given for 16 years, has never been a part of the curriculum required by the State; and so, with the ever increasing demand for trained nurses and, therewith, the necessity for cutting down the training time to as short a period as possible, everything not absolutely essential is being omitted. Nevertheless, St. Johns Hospital sent us their class of 37 young women for 5 weeks in the fall (10 weeks is the usual length of the course), and the Staten Island, and the Methodist and Norwegian hospitals in Brooklyn sent us their students for at least one trip through the garden to see the important medicinal plants. But when the groups come only once or twice, according to our custom they are classified under the heading of visiting classes, and not as registered students.

**Courses Given by This Department.**—The Conservatory course entitled "Plants of Tropical America" was fairly well attended, 24 people registering. This course consisted of 6 weekly tours through the conservatories Wednesdays at 3 p.m. to see the important economic plants. Informal talks were given by Dr. Gundersen, Miss Rusk, Miss Ashwell, and myself. In my course on Trees and Shrubs, 19 people registered in the spring and 20 in the fall. In the new course—"Trees in the Botanic Garden"—which Dr. Gundersen and I offered, 6 people registered. For the course A44, "Gardens within a Garden," 52 people registered. This consists of weekly tours through the garden to see various floral displays and to get acquainted with the general plan of the Garden. As of last year, this course was one of those on the calendar of the Department of Education of the Brooklyn Institute in cooperation with the Botanic Garden. Miss Rusk gave 4 courses on native ferns and wild flowers, three of them out-of-door courses and 1 combining laboratory and field work. She assisted me in the course in the fall given to the class of 37 student nurses from St. Johns Hospital.

**Publicity.**—Seventy-one pages of news items about the Garden were mailed at weekly or biweekly intervals through the year to principal metropolitan newspapers and to various periodicals, especially those dealing with gardening or the home. As usual, members of our staff have given radio talks over WNYC, the municipal station, from January to June and from October to December inclusive. This year these talks came on alternate Fridays at 3:30 p.m. Programs of these talks were prepared, printed and issued to members and friends of the Garden. Courses about to start at the Garden have been described in these broadcasts and the public invited to attend. Circulars of our winter, spring, and fall courses were mailed to members and to former students in our classes. The annual *Prospectus* of Courses was issued in early September. Postcard bulletins were mimeographed and mailed to members of the Garden as follows: January 15, announcing the special conservatory exhibits of rubber, beverage, fiber plants, etc.; March 8, telling of seed catalogs available for consultation in the Library; April 12, inviting members to a showing of sound films on Victory Gardening; September 13, telling of the Harvest Show in the Rotunda; and November 5, announcing the special display of Chrysanthemums in the Conservatories. From January to April, inclusive, and in November and December, I have prepared or written articles on the Botanic Garden for the Brooklyn Institute *Bulletin*. I have announced the events at the Garden through the year, by means of the four bulletin boards on the grounds, and in the IRT Eastern Parkway-Brooklyn Museum station. Placard advertisements of the Garden, telling of its principal features and attractions, have been placed in Brooklyn trolley cars, and arrangements for inserting similar cards in the New York subways are now under way.

**Personnel.**—Miss Rusk has continued to serve as Librarian and Curator of the Herbarium of the American Fern Society. Besides her teaching of classes, mentioned above, she has assisted in docentry, prepared monthly, quarterly, and annual reports, compiled the copy for the annual *Prospectus* of Courses, and assisted us in various other ways. As in former years, she had the voluntary assistance of Mrs. Herbert Lawrence, a member of the Garden, for two half-days each week during the first half of the year. In the summer Miss Rusk assisted me at the experimental chestnut plantations at Hamden, Connecticut.

I have continued to serve as counselor for the Brooklyn Branch of the Boy Scouts of America, examining candidates for merit or for eagle badges; as editor of the plant section of General Biology for *Biological Abstracts;* editor of the Brooklyn Botanic Garden *Leaflets* and of the *Contributions;* an associate editor of the *Bulletin of the Torrey Botanical Club;* a Director of the School Nature League of Manhattan; councillor for the Torrey Botanical Club; member of the Museums Council of New York City; and Collaborator of the Division of Forest Pathology of the Bureau of Plant Industry, United States Department of Agriculture. With the exception of ten days' vacation in August, I spent the summer, from June 15 to September 15, in research work at our chestnut plantation at Hamden, Connecticut.

**Bureau of Information.**—As usual, a considerable amount of time has been consumed in answering requests for information by telephone, by letter, and in person.

**Woods Sent to Yale.**—During the year, wood samples of the following species were sent to the Yale School of Forestry to enrich their collection; and, at the same time, specimens were added to our own collections: *Koelreuteria paniculata; Cedrela sinensis; Hippophae rhamnoides;* Rose, Dr. Van Fleet; *Rhus trilobata; Picrodendron; Benzoin aestivale.*

**Alumni Reunion.**—On Saturday afternoon, March 6, Mr. Rutherford Platt of the Platt-Forbes Company of New York City, again showed selections from his series of unique kodachrome slides to an enthusiastic audience composed of alumni of our out-of-door classes. The affair was called "Indoor winter field trip for 'friends of plants' (philophytes)." The Garden is indebted to Mr. Platt for his excellent and interesting presentation of his subject and for this evidence of his continued interest in its work.

**Abraham Lincoln High School Field Day.**—On Saturday morning, May 15, 90 pupils of the Abraham Lincoln High School biology department observed their annual Brooklyn Botanic Garden field day. Outlines of the various features of the Garden, prepared and mimeographed by this department, were distributed to them. They were docented in the Wild Flower Garden by Miss Rusk, and Miss Clarke explained the demonstration victory gardens. Their visit concluded with a talk on Victory Gardening, illustrated by lantern slides, by Miss Clarke in the auditorium.

Respectfully submitted,

ARTHUR HARMOUNT GRAVES,
*Curator of Public Instruction.*

## REPORT OF THE CURATOR OF ELEMENTARY INSTRUCTION FOR 1943

TO THE ACTING DIRECTOR:

The war has caused drastic changes in our Department's work.

*A. Teachers' Classes.*—Classes have changed entirely. No one of our regular classes was dropped. In fact, new classes have been added by request of the Board of Education and by individual groups of teachers. The Department has also done its part in the Victory Garden program set up for the general public.

*B. Distribution of Material.*—This year there was renewed interest in this phase of our work. Service was extended to over 4,000 teachers and the materials were used in classes represented by 187,000 children.

*C. Children's Saturday Morning Classes.*—These remained the same in numbers, but during the summer older boys and girls left to help on farms and in other phases of war work. This threw greater responsibility upon the children, which, in a way was no hardship. Their gardens were planned as "War Gardens" and much home canning was done.

*D. Visiting Classes.*—The spring list of talks offered to the schools was short, cut down to cover only subjects relating to the war, such as "Plants bottle-necked by the war—rubber, fiber, and beverage plants," "Victory Gardens," etc. The classes did not come in large groups but in small ones, due to recommendations made by the Board of Education. No list of lectures was was sent out in the fall because of much seed work to do. Still classes came!

*E. Seed Work.*—The same landslide which general seed houses encountered in the spring was ours too. It was quite impossible to fill all the orders sent to us from the schools. Our penny packets of seed are used in children's home gardens. In March the vegetable packets gave out and much time had to be spent in filling more—a great handicap to the work. Another set-back due to the war came through the printing company. Because of the priority of government orders, we were unable to have our seed envelopes until late August. Nearly half the filling of packets is usually done by children during the summer as part of their contribution to the Garden and for advancement for their honors. Since this papering of seed must be done, the Department has put in days and hours on this mechanical job, which, if not covered, would embarrass the Department's financial budget. It is a serious matter for a department of education to be obliged to set aside an important part of a program which is essential. A better adjustment of work should be made so that those appointed to educational positions should not be obliged to spend undue time on mechanical work.

The following figures show something of the work accomplished during 1943 in spite of the handicaps mentioned.

Study Material was supplied to 150 institutions as a result of 224 requests.

Plants raised in our Brooklyn Botanic Garden classes numbered nearly 25,000. This figure represents the work of nearly 900 students—children and adults. Besides these, all plants raised in all other Victory Garden courses are handled in the Department's instruction greenhouses.

Plants distributed to school gardens numbered somewhat over 1,000. These were given to help the Victory Garden movement.

Crops from the Children's Garden amounted in market price to about $1,600 this year. Our bumper crops were represented by nearly two tons of tomatoes, over 8,000 beets, nearly 800 pounds of beans and chard, and over 200 pounds of New Zealand spinach. Only marketable crops are included in these numbers.

*Other Activities.*—Potted plants were given to the Brooklyn Naval Hospital at Easter, and a part of the Children's Garden was planted with annuals which supplied a weekly box of flowers to the Hospital from July until October. Potted plants were also given to be sold at a Carnival to raise money for the maintenance of the Music Box Canteen for Merchant Marine, Soldiers, and Sailors, and to the Brooklyn High School for Homemaking for a Red Cross benefit. Five dozen plants were given at Christmastime to Hospitalized Service Men.

The Department assisted in two series of Victory Garden lectures given at Bloomingdale's.

A special course was given to teachers from the Brooklyn High School for Specialty Trades at the request of their Principal.

The Assistant Curator worked with the Harmon Foundation on a garden film which has not been completed.

It might be pertinent to mention here that the extra Victory Garden courses given to teachers include practice for every single teacher in spading, raking, hoeing, making of drills and hills, and planting of seed.

The fourth in our series of booklets, "Our Boys and Girls Club," has been printed.

The Boys and Girls Club still supports as a war project the Christmas treat for boys and girls of our village—Northbourne, England. £18 sterling and two boxes of clothing were sent to the Village this year.

The sum of $50 was given by the Goodman Family to remake the rose garden in the Children's Garden area and to buy new roses. This is a memorial garden to Bernard Goodman, once a member of the Boys and Girls Club.

Miss Sadie Hecht's gift of four war bonds for the Ellen Eddy Shaw Endowment Fund should also be noted.

Respectfully submitted,
ELLEN EDDY SHAW,
*Curator of Elementary Instruction.*

## REPORT OF THE CURATOR OF PLANTS FOR 1943

TO THE ACTING DIRECTOR:

In the list of trees of the Garden printed two years ago were included a number of small doubtfully hardy trees in the nursery, most of these have not survived the past two winters. We have had many trees, for example *Sequóia* and *Abies concolor*, living to ten years or so, then loosing them in an unfavorable season. If we could, by special care or soil conditions, bring them to a larger size they might have a chance of becoming established. Red Pine and Western Yellow Pine thrive a short distance Northward, but we have had no success with these. In spite of city conditions a few of our conifers such as the Atlas Cedars, Himalayan Pine, Cryptomeria and others are outstanding trees in our Garden.

Mr. C. F. Doney reports that a few new species and varieties were added to our collections, among them *Quercus Libani,* and *Gleditsia sinensis.* On the border mound some old plantings of common material, as Rhodotypus and Privet, were replaced with groups of such uncommon plants as Orixa, Cudrania and Staphylea hybrids. A collection of young hybrid Azaleas from the U.S.D.A. was planted near the south end of the Garden. With the practical discontinuation of the International Seed Exchange the number of plants in our nursery is sharply reduced.

Gradually our lilac collection is being arranged by groups, with those not of the first rank separated.

A list of plants in the new Desert Plant House was made by Mr. Doney and Miss Clarke. In the fall Miss Clarke assisted in the naming of our palm collection, about thirty species.

Our collection of specimens of cultivated plants has been further improved and expanded. A collection of specimens of Herb Garden plants was made.

With Dr. Graves I gave a spring course on Trees in the Garden, Mr. Doney gave his usual courses on Ornamental Shrubs.

Signs and labels were made by Mr. John McCallum as follows:

| | |
|---|---|
| Small galvanized labels for herbaceous beds and Rose Garden | 18 |
| Lead labels for woody plants | 15 |
| Small wood labels for Roses, Iris etc | 363 |
| Large wood labels | 31 |
| Wooden signs | 25 |
| Cardboard signs | 50 |
| Twelve inch wood labels for special planting | 70 |
| Wooden hanging labels for woody plants | 96 |
| Total | 668 |

Also numerous miscellaneous numbers and signs.

Respectfully submitted,
ALFRED GUNDERSEN,
*Curator of Plants.*

# REPORT OF THE CURATOR OF THE HERBARIUM FOR 1943

To the Acting Director:

**The Local Flora Section.**—With the accession of the limestone ledge described in last year's *Record* the plant habitats of the Local Flora Section have all been established. Much still remains to be done in improving soil conditions, especially in the vicinity of the new limestone development, and such improvements will be followed by introduction of many native plants not yet represented. Their acquisition will require visits to the New Jersey pine barrens and to the Catskill Mountains which represent the southern and northern limits respectively of our distribution area. With the increasing growth of trees, especially conifers, a windbreak has been formed which allows the continued growth in sheltered spots of southern plants such as the sand myrtle (*Leiophyllum buxifolium*). Removal of trees from original plantings is still going on, mostly European lindens, but including also some gigantic *Weigela* and *Cornus Amomum* bushes. Rabbits (which have been our greatest pest) have unaccountably decreased during the past year, but are still in sufficient number to do a great deal of damage. For example, during the past month all the leaves of our pitcher plants have been eaten off.

**Herbarium.**—With the help of Miss Edson during the spring months some of the critical material was mounted, especially of collections from Panama and Alaska, but much still remains in the storeroom.

Herbarium Material Loaned.—

| | *Sheets* |
|---|---|
| American Fern Society, Brooklyn, N. Y. | 7 |
| Beetle, Dr. Alan A., Agricultural Experiment Station, University of California, Davis, Calif. | 651 |
| Blake, Dr. S. F., Arlington, Va. | 4 |
| Boivin, Mr. Bernard, Cambridge, Mass. | 20 |
| Gregory, Dr. M., University of Virginia, Charlottesville, Va. | 8 |
| Morton, Mrs. James, Philadelphia College of Pharmacy and Science, Philadelphia, Pa. | 16 |
| Schweinfurth, Mr. Charles, Botanical Museum, Harvard University, Cambridge, Mass. | 3 |
| Shaver, Dr. J. M., George Peabody College for Teachers, Nashville, Tenn. | 1 |
| Underwood, Dr. J. K., University of Tennessee, Knoxville, Tenn. | 2 |
| U. S. National Herbarium, Washington, D. C. | 1 |
| | 713 |

### HERBARIUM MATERIAL BORROWED FOR STUDY.—

| | |
|---|---|
| Beetle, Dr. Alan A., Agricultural Experiment Station, University of California, Davis, Calif. | 133 |
| Blake, Dr. S. F., Arlington, Va. | 1 |
| Davis, Prof. R. J., University of Idaho, Southern Branch, Pocatello, Idaho | 1 |
| Gray Herbarium, Cambridge, Mass. | 157 |
| Lepage, Rev. Ernest, École d'Agriculture, Rimouski, Québec, Canada | 13 |
| Lundell, Dr. C. L., University of Michigan, Ann Arbor, Mich. | 1,143 |
| Marie-Victorin, Dr. F., Montreal Botanical Garden, Montreal, Canada | 3 |
| New York Botanical Garden, Bronx Park, New York, N. Y. | 2,202 |
| O'Neill, Rev. Hugh, The Catholic University of America, Washington, D. C. | 19 |
| Rogers, Mrs. Charles H., Princeton, N. J. | 6 |
| Runyan, Hon. Robert, Brownsville, Texas | 53 |
| U. S. Forest Service, Washington, D. C. | 2 |
| U. S. National Herbarium, Washington, D. C. | 139 |
| | 3,872 |

Respectfully submitted,

HENRY K. SVENSON,
*Curator of the Herbarium.*

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## REPORT OF THE HORTICULTURIST FOR 1943

TO THE ACTING DIRECTOR:

I submit herewith my report for the year ending December 31, 1943.

Twelve men left the Garden in the course of the year—a greater labor turnover than we have had for many years. Three went into the Armed Forces; and several engaged in war industry. Their places were filled by women and older men.

Good progress was made in the reorganization of the Conservatories in accordance with a plan proposed by a committee consisting of Dr. Reed, Dr. Gundersen, Miss Dorward and the Horticulturist.

The winter of 1942–43 severely injured many deciduous shrubs and trees; the flowering cherries in particular suffering badly from frost cracks. The Rose Garden was especially hard hit, necessitating 380 replacements. For these we are indebted to Bobbink & Atkins, 249; The Conard Pyle Company, 26; Jackson & Perkins Company, 55; and Traendly & Schenck, 50.

The widespread interest in vegetable gardening resulted in a greatly increased number of requests for information which were answered by telephone, in person, and by mail.

A section of a small vegetable garden demonstrating depth of planting, spacing, etc. was installed in the Ingersoll Memorial Library and was on exhibition from April 6th to April 18th.

Part of a collection of fuchsias intended for exhibition at the International Flower Show (not held in 1943) was shown at an exhibition held for the benefit of the American Red Cross by the Horticultural Society of New York.

The limestone fountain basin in the Horticultural Section showed signs of disintegration as a result of weathering. It was repaired and waterproofed by the Obelisk Waterproofing Company. As a further precaution against winter injury covers were made and installed by our men for this, the Conservatory fountain, and the well-head in the Medicinal Garden.

Termites having attacked the Japanese Garden fence it became necessary to remove the posts from contact with the soil. To this end the laboring force made 37 concrete blocks and assisted outside carpenters in repairing and resetting the fence.

Personal activities included service on the Editorial Board of The Home Garden; the Greater New York Victory Garden Council and on its Executive Committee; and judging vegetables at the Kings County Victory Fair.

I gave 2 courses of lectures for Victory Garden Precinct Leaders of the C.D.V.O. and prepared material for a Victory Garden "work sheet" of which 250,000 copies were printed by the C.D.V.O. for distribution. In addition to the courses scheduled in the Prospectus, I gave 22 talks and demonstrations on vegetable growing.

Respectfully submitted,

MONTAGUE FREE,
*Horticulturist.*

## REPORT ON THE LIBRARY FOR 1943

To the Acting Director:

The library added to its collection of Rafinesque's works twelve originals, including his Alsographia Americana and his Autikon Botanikon. A most useful gift was the gift by the Woman's Auxiliary of Webster's New International Dictionary of the English Language, 2d edition, 1943. From the Estate of Anna and Katherine Hollwegs, former members of the Garden, a gift of fourteen volumes was received. Ninety-one books were collected and turned over to the 1943 Victory Book Campaign. In connection with the Victory Garden Campaign the library had a display of catalogs of dealers in vegetable seeds. An exhibit of old herbals was displayed for the meeting of the Herb Society of America on May 4th.

The collections at present comprise 45,016 pieces of which number 23,219 are volumes and 21,797 are pamphlets, an increase of 267 volumes and 565 pamphlets, or 832 pieces during 1943. Volumes purchased totaled 153. Gifts during the year were 81 volumes, 372 pamphlets, and 936 parts. The list of donors is included in Appendix I.

Of periodicals and other serials the library received 488 as exchanges, 90 as gifts, 99 as purchases, and 5 through publication, making a total of 682 titles.

Loans to other institutions totaled 32 items; 2 items were borrowed from other libraries for the use of our staff.

Respectfully submitted,
William E. Jordan,
*Librarian.*

### Statistical Report on the Library

### Accessions

| | *Autograph Letters* | *Portraits* | *Volumes* | *Pamphlets* | *Parts (Including Periodicals)* |
|---|---|---|---|---|---|
| Exchange | 0 | 0 | 33 | 97 | 3,149 |
| Gift | 0 | 29 | 81 | 372 | 936 |
| Publication | 0 | 0 | 0 | 82 | 48 |
| Purchase | 5 | 2 | 153 | 14 | 714 |
| Total | 5 | 31 | 267 | 565 | 4,847 |

| | |
|---|---|
| Books, pamphlets, and serials catalogued | 872 |
| Total number of cards typewritten and filed | 1,480 |
| Torrey Botanical Club index cards filed during 1943 making a total of 63,857 | 1,284 |
| Number of users of the Library | 3,230 |
| Books lent to members of the staff | 1,651 |
| Reference questions | 414 |

### AMERICAN FERN SOCIETY COLLECTION

| | |
|---|---|
| Total number of volumes in American Fern Society Collection, December 31, 1943 | 62 |
| Total number of pamphlets | 326 |
| Number of parts added during 1943 | 28 |

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## REPORT OF THE RESIDENT INVESTIGATOR (FERNS) FOR 1943

TO THE ACTING DIRECTOR:

I submit herewith my report for the year ending Dec. 31, 1943. In genetic and botanical research, I have maintained the greenhouse collections of Nephrolepis species and varieties, and of a number of native fern species cared for under lath shelter in the Experimental Field. The scientific interest which attaches to the Nephrolepis variants has recently found expression in another text citation, a book by Julian Huxley in the field of evolution. I would note again that the general fern collection comprises a good selection of this group of the most primitive stem of the higher plants, those with vascular tissue. In addition to its botanical interest, it includes also most if not all of those fern species which have been and still are well adapted for house plant culture.

The Brooklyn Botanic Garden is one of the centers of fern study and interest both in this country, and internationally, through the fact that it is headquarters for many of the activities and collections of the American Fern Society. Dr. Svenson as Treasurer, Miss Rusk as Librarian, and Curator of the Fern Society Herbarium, my own association as one of the editorial staff of the *American Fern Journal*, and the Garden storage and management of all the back files of the *Fern Journal's* nearly thirty-five years of publication—all these combine with Dr. Svenson's fern research and my own, to carry the Garden's contributions to fern study widespread.

I have taken an active part during the past summer in the establishment of an up-State work-study summer session for Brooklyn College students at the N. Y. Agricultural and Technical Institute at Morrisville, N. Y. One hundred and fifty city students who had volunteered for service on the food production front, were quartered in the dormitories of the Morrisville Institute. There they also met daily with a regular Brooklyn College staff of teachers, taking and completing a series of regular college courses most of which were specially correlated with the rural environment. From the Institute as headquarters they went forth daily to pick peas and beans for market and canning factory use. Their total production for the summer was 22,000 bushels of these essential foods. This project, which it is hoped may be an exemplar for an expanded and continued city-country educational program, has had the enthusiastic support of state, and federal, as well as city educational agencies.

Respectfully submitted,

RALPH C. BENEDICT,

*Resident Investigator (Ferns).*

## REPORT OF THE RESIDENT INVESTIGATOR (ECONOMIC PLANTS) FOR 1943

TO THE ACTING DIRECTOR:

I herewith submit a report for the year 1943. With the consent of the Garden, the Brooklyn Botanic Garden—Long Island University Course dealing with Economic Botany was omitted during the academic year 1942–1943. Several student groups from Long Island University were instructed in the taxonomy of medicinal and other economic plants, by use of the Botanic Garden Conservatories and Grounds.

During the summer of 1943, a survey dealing with the availability of drug plants in approximately 2,000 nurseries in the States of New York, New Jersey, Connecticut, and Massachusetts was completed. The results of this survey as a contribution to the War Effort in terms of specific information regarding medicinal plants will be published in the immediate future.

My research this year involved a continuation of my investigations to determine the physiological effects of the various substitute teas being used more widely during this current war period than under normal conditions. Several species of Rosa (Hips) and Rubus (leaves) were given special attention. During the Spring, the medicinal plants in the Botanic Garden were treated in a semi-popular fashion for publication in the July issue of the Garden *Record.* This work was organized by Dean C. W. Ballard of the College of Pharmacy, Columbia University, with the collaboration of the Resident Investigator (Econ. Plants) of the Brooklyn Botanic Garden; and Professor F. J. Pokorny of Columbia University.

Respectfully submitted,
RALPH H. CHENEY
*Resident Investigator (Economic Plants).*

# FINANCIAL STATEMENT FOR 1943

## I*a*. TAX BUDGET JANUARY 1, 1943–JUNE 30, 1943

| *Accounts* | *Balances, December 31, 1942, of appropriations for period 7/1/42–6/30/43* | *Expenditures 1/1/43–6/30/43* | *Balance June 30, 1943* |
|---|---|---|---|
| ***Personal Service*** | | | |
| Salaries—Regular Employees | $31,352.50 | $30,494.15 | $ 858.35 |
| Wages—Temporary Employees | 11,069.50 | 9,659.56 | 1,409.94 |
| Total Personal Service | $42,422.00 | $40,153.71 | $2,268.29 |
| ***Other than Personal Service*** | | | |
| Supplies, Equipment, Materials, Repairs and Services | 4,879.02[1] | 4,853.49 | 25.53 |
| Totals | $47,301.02 | $45,007.20 | $2,293.82 |

## I*b*. TAX BUDGET JULY 1, 1943–DECEMBER 31, 1943

| | *Appropriations for period 7/1/43–6/30/44* | *Expenditures 7/1/43–12/31/43* | *Balance December 31, 1943* |
|---|---|---|---|
| ***Personal Service*** | | | |
| Salaries—Regular Employees | $65,325.00 | $31,943.06 | $33,381.94 |
| Wages—Temporary Employees | 23,696.00 | 12,982.50 | 10,713.50 |
| Total Personal Service | $89,021.00 | $44,925.56 | $44,095.44 |
| ***Other than Personal Service*** | | | |
| Supplies, Equipment, Materials, Repairs and Services | 6,568.97 | 4,098.08 | 2,470.89 |
| Totals | $95,589.97 | $49,023.64 | $46,566.33 |

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[1] Includes transfer of $236.09 transferred from Code 5442–109 "Fuel Supplies" to Codes 5442–101 "Office Supplies," 5442–104 "Printing, Binding and Reproduction Supplies," 5442–149 "Other Operating and Maintenance Supplies," 5442–408 "Repairs to Buildings and Structures" and 5442–409 "Repairs to Office and Other Operating Equipment," in accordance with Board of Estimate of resolution dated July 15, 1943.

## II. Private Funds Accounts

| Permanent Funds (*Restricted*[1]) | *Principal* | *Balance January 1, 1943* | *Income* | *Expenditures* | *Balance December 31, 1943* |
|---|---|---|---|---|---|
| 1. Endowment Fund | $55,238.67 | $ 0.00 | $ 2,208.78 | $ 2,208.78 | $ 0.00 |
| 2. Life Membership | 11,068.08 | 0.00 | 442.74 | 442.74 | 0.00 |
| 3. George C. Brackett | 560.89 | 10.99 | 22.40 | 27.35 | 6.04 |
| 4. Cary Library Fund | 2,248.71 | 12.37 | 89.92 | 90.99 | 11.30 |
| 5. Benjamin Stuart Gager | 15,180.91 | 289.36 | 607.22 | 447.80 | 448.78 |
| 6. Martha Woodward Stutzer | 10,913.34 | 3.10 | 437.54 | 389.19 | 51.45 |
| 7. Mary Bates Spalding | 2,974.64 | 82.65 | 118.95 | 0.00 | 201.60 |
| 8. Alfred T. White | 272,304.99 | 0.00 | 10,892.16 | 10,892.16 | 0.00 |
| 9. A. Augustus Healy Bequest | 10,809.60 | 0.00 | 432.37 | 432.37 | 0.00 |
| 10. Robert B. Woodward Bequest | 27,030.73 | 0.00 | 1,081.19 | 1,081.19 | 0.00 |
| 11. Endowment Increment Fund | 65,013.32 | 0.00 | 2,536.21 | 2,536.21 | 0.00 |
| 12. A. T. White Memorial Tablet | 4,248.33 | 0.00 | 169.88 | 169.88 | 0.00 |
| 13. Brooklyn Institute Centennial | 32,336.03 | 0.00 | 1,293.44 | 1,293.44 | 0.00 |
| 14. John D. Rockefeller, Jr. | 265,062.22 | 0.00 | 10,602.47 | 10,602.47 | 0.00 |
| 15. Citizens Endowment | 269,191.38 | 0.00 | 10,767.63 | 10,767.63 | 0.00 |
| 16. Henry W. Healy Trust | 54,608.53 | 171.80 | 2,019.14 | 935.46 | 1,255.48 |
| 17. Mrs. H. C. Folger Fund | 1,005.29 | 29.86 | 40.23 | 35.00 | 35.09 |
| 18. John W. Frothingham | 10,000.00 | 0.00 | 400.00 | 400.00 | 0.00 |
| 19. F. E. W. Fund | 250,000.00 | 0.00 | 10,000.00 | 10,000.00 | 0.00 |
| 20. Ellen Eddy Shaw Endowment | 24,472.67 | 963.58 | 975.16 | 297.06 | 1,641.68 |
| 21. Herbarium Endowment | 4,000.00 | 64.26 | 160.00 | 165.18 | 59.08 |
| 22. Public Instruction Endowment | 2,234.93 | 132.85 | 89.37 | 25.00 | 197.22 |
| Totals | $1,390,503.26 | $ 1,760.82 | $ 55,386.80 | $ 53,239.90 | $ 3,907.72 |
| *Special Accounts (Restricted)* | | | | | |
| 23. Ella Reussner Trust Income Account | | $ 449.12 | $ 2,072.11 | $ 2,037.60 | $ 483.63 |
| 24. Sustaining Membership | | 609.76 | 1,216.18 | 1,326.14 | 499.80 |
| 25. Annual Membership | | 275.99 | 3,292.95 | 2,527.12 | 1,041.82 |
| 26. Tuition and Sales | | 1,627.33 | 16,288.84 | 16,829.15 | 1,087.02 |
| 27. Collections Fund | | 260.71 | 4,884.19 | 3,979.21 | 1,165.69 |
| 28. Special Purposes | | 4,946.59 | 7,650.89 | 8,225.93 | 4,371.55 |
| 29. Plant Pathology Research | | 0.00 | 6,500.00 | 6,500.00 | 0.00 |
| 30. Special Contributions | | 2,812.87 | 69,179.41 | 60,242.42 | 11,749.86 |
| Totals | | $10,982.37 | $111,084.57 | $101,667.57 | $20,399.37 |
| Gross Totals | $1,390,503.26 | $12,743.19 | $166,471.37 | $154,907.47 | $24,307.09 |
| Deduct inter-account transactions | | | 71,632.71 | 71,632.71 | |
| Grand Totals | $1,390,503.26 | $12,743.19 | $ 94,838.66 | $ 83,274.76 | $24,307.09 |

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[1] To the educational and scientific work of the Garden.

## III. SUMMARY OF TOTAL MAINTENANCE BUDGET FOR CALENDAR YEAR 1943

| | *Income* | | | *Expenditures* | | | |
|---|---|---|---|---|---|---|---|
| | *Personal Service* | *Other than Personal Service* | *Total* | *Personal Service* | *Other than Personal Service* | *Total* | *Balance* |
| Balance at Dec. 31, 1942 of Tax Budget Appropriations 7/1/42–6/30/43 | $ 42,422.00 | $ 4,879.02[1,2] | $ 47,301.02 | $ 40,153.71 | $ 4,853.49 | $ 45,007.20 | $ 2,293.82[2] |
| Tax Budget Appropriation 7/1/43–6/30/44 | 89,021.00 | 6,568.97 | 95,589.97 | 44,925.56 | 4,098.08 | 49,023.64 | 46,566.33 |
| Total | $131,443.00 | $11,447.99 | $142,890.99 | $ 85,079.27 | $ 8,951.57 | $ 94,030.84 | $48,860.15 |
| Less Balance at 12/31/43 of Tax Budget Appropriation for 7/1/43–6/30/44 | 44,095.44 | 2,470.89 | 46,566.33 | | | | 46,566.33 |
| Tax Budget (47.20%) | 87,347.56 | 8,977.10 | 96,324.66 | 85,079.27 | 8,951.57 | 94,030.84 | 2,293.82[2] |
| Private Funds (52.80%) | 71,992.28 | 35,589.57 | 107,581.85 | 60,242.42 | 23,032.34 | 83,274.76 | 24,307.09 |
| Totals | $159,339.84 | $44,566.67 | $203,906.51 | $145,321.69 | $31,983.91 | $177,305.60 | $26,600.91[2] |

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[1] Includes transfer of $236.09 transferred from Code 5442–109 "Fuel Supplies" to Codes 5442–101 "Office Supplies," 5442–104 "Printing, Binding and Reproduction Supplies," 5442–149 "Other Operating and Maintenance Supplies," 5442–408 "Repairs to Buildings and Structures" and 5442–409 "Repairs to Office and Other Operating Equipment," in accordance with Board of Estimate resolution dated July 15, 1943.

[2] Balance of $2293.82 remaining from City Appropriation 1942–1943 reverted to City of New York—"General Accrual Fund."

Respectfully submitted,
EDNA A. PALMITIER,
*Acting Secretary.*

*Note:* The above "Financial Statement" is a transcript of Brooklyn Botanic Garden Accounts in the books of the Treasurer of the Brooklyn Institute of Arts and Sciences. The Treasurer's accounts are audited annually by a Public Accountant, and a separate audit of this "Financial Statement" is not made in order to save unnecessary expense.

EDWIN P. MAYNARD,
*Treasurer.*

# APPENDIX I

## GIFTS RECEIVED DURING 1943

### Collections Fund *

Mrs. Helen K. Anderson
Mrs. Frank L. Babbott
Battle Pass Chapter—D.A.R.
Philip A. Benson
Miss Dorothy L Betts
Mrs. S. Parkes Cadman
Mrs. Otis D. Carroll
Mrs. Franklin Chace
Mrs. Walter V. Cranford
Walter H. Crittenden
Otto Ebel
Mrs. William W. Emerson
Mrs. Ida M. Faron
Mrs. Lewis W. Francis
Mrs. Ernest P. Goodrich
Mrs. J. Morton Halstead
Anonymous
Anonymous
Mrs. Raymond V. Ingersoll
William L. James
Mrs. Warren Kenny
Dr. Laura A. Kolk
Mrs. John E. Leech
Miss Hilda Loines
Mrs. George Lyons
Mrs. Edwin P. Maynard
Thomas Mehring
Mrs. Whitney Merrill
Mrs. Dean C. Osborne
Dr. Mabel H. Otis
Mrs. Charles E. Perkins
Mrs. W. Sterling Peters
Mrs. James H. Post
Mrs. Frederic B. Pratt
Mrs. Benjamin Prince
Miss Mary S. Pullman
Norman Roy
Mrs. Frank E. Simmons
Miss Elise W. Stutzer
William J. Wason, Jr.
Mrs. Walter F. Wells
Miss Harriet H. White
Women of '76 Chapter N.S.D A.R.
Frank Uthoff
Anonymous

| | |
|---|---|
| Total amount contributed | $3,354.00 |

### Plant Pathology Research Fund

| | | |
|---|---|---|
| Anonymous | $1,500.00 | |
| Anonymous | 2,500.00 | $4,000.00 |

### Ellen Eddy Shaw Endowment Fund

| | | |
|---|---|---|
| Mrs. Joseph Dugan | $ 2.00 | |
| Miss Sadie Hecht—4 Series F Bonds ($25.00 face value) | 74.00 | $ 76.00 |

* Note:—Contributions to the Brooklyn Botanic Garden constitute proper deductions under the Federal Income Tax Law.

## Special Gifts for Children's Work

| | | |
|---|---|---|
| John F. Struse | $ 10.00 | |
| Mrs. A. Sanders | 3.53 | |
| Mrs. Charles Perkins | 25.00 | $ 38.53 |

## Special Needs of the Garden

| | |
|---|---|
| Anonymous | $ 500.00 |

## Special Purposes Designated by Donors

| | | |
|---|---|---|
| Mrs. Dean C. Osborne | $ 920.00 | |
| Anonymous | 500.00 | |
| Woman's Auxiliary | 500.00 | |
| Anonymous | 250.00 | |
| Goodman Family | 50.00 | |
| Miss Sadie Hecht—1 Series F Bond ($25.00 face value) | 18.50 | $2,238.50 |

## Library

A total of 81 books, 372 pamphlets and 936 parts of publications (exclusive of Government documents) in addition to 29 portraits and photographs, and 76 miscellaneous items were received as gifts. A list of donors follows.

Agricultural Insecticide and Fungicide Association
Sr. J. C. Ahumada
American Association of Botanical Gardens and Arboretums
American Begonia Society
American Fern Society
American Forest Products Industries
American Forestry Association
American Horticultural Society
American Museum of Natural History
American Potash Institute
American Soybean Association
Prof. Oakes Ames
Dr. Conrado F. Asenjo
Astronomical Society of the Pacific
Miss Elizabeth M. Back
Prof. L. H. Bailey
Barclay Madison Corporation
Dr. Thomas J. Barrett
Miss Katharine Bartlett
Bartlett Tree Research Laboratories
Mr. William J. Beecher
Dr. Ralph Curtiss Benedict
Mrs. E. A. Bergstrom
Berkshire Garden Center
Bernice P. Bishop Museum
Biochemical Research Foundation of the Franklin Institute
Dr. P. Böhner
Mr. Anthony A. de Bole
Dr. Miriam L. Bomhard
Dr. Gregorio Bondar
Botanical Society of Edinburgh
Prof. Donald D. Brand
Dr. E. Lucy Braun
British Columbia Provincial Museum
British Museum (Natural History)
Brooklyn Botanic Garden Woman's Auxiliary

Mr. J. G. Brown
Mr. S. C. Bullenkamp
Dr. Stanley A. Cain
Canadian Seed Growers Association
Prof. Martin Cardenas
Carnegie Institution of Washington
Miss Gladys Carroll
Charles Lathrop Pack Forestry Foundation
Chilean Nitrate Educational Bureau
Cincinnati. Board of Park Commissioners
Mrs. Jay Clark, Jr.
Mr. I. W. Clokey
College of the City of New York
Colorado State College Library
Dr. W. S. Cooper
Cranberry Canners, Inc.
Mrs. Joseph M. Cudahy
Mr. William T. Davis
Davison Chemical Corporation
Mr. H. De Forest
Difco Laboratories
Prof. Erling Dorf
Duke University
DuPont de Nemours & Company, Inc.
Mr. Theodore P. Dykstra
Ecuador. Universidad Central
Dr. W. H. Emig
Eugenics Society of Northern California
Mrs. D. E. Eyles
Dr. David Fairchild
Dr. Oliver A. Farwell
Prof. H. I. Featherly
Rev. John Fernand
Field Naturalists' Club of Victoria
Filson Club
Fisher Scientific Company
Food Research Institute, Stanford Univ.
Mr. Montague Free
Dr. C. Stuart Gager
Mrs. C. Stuart Gager
Mr. A. O. Garrett
George Washington Carver Foundation, Tuskegee Institute
Mr. Tom Gill
Mr. Harold S. Gladwin
Dr. Arthur Harmount Graves
Dr. Ernest Guenther
Dr. T. P. Haas
Mr. Stuart K. Harris
Mr. Stanley W. Hayes
Miss Sadie Hecht
Hon. James J. Heffernan
Herb Society of America
Miss Elizabeth Hess
Mr. Henry Hicks
Estate of Anna Hollwegs
Mr. R. E. Horsey
Dr. Homer D. House
Mr. John T. Howell
Huntington College Botanical Garden and Arboretum
Dr. Annie M. Hurd-Karrer
Mr. Blythe Hurst
Illinois Audubon Society
Mr. Charles F. Jenkins
John Innes Horticultural Institution
Miss Edith D. Johnston
Mr. Arthur Pierson Kelley
Mr. E. B. Kester
Dr. Walter Knoche
Dr. Laura A. Kolk
Mr. L. F. Lambert
Dr. Frederic T. Lewis
Life Magazine
Dr. Walter F. Loehwing
Lombard, Illinois. Park District
Prof. B. J. Luyet
Mahogany Association, Inc.
Mr. David S. Marx
Medical Society of the County of Kings
Merck and Company, Inc.
Dr. E. D. Merrill
Michigan State College. Dept. of Farm Crops

Middle America Information Bureau
Montevideo. Museo de Historia Natural
Dr. R. M. Moscoso
Mr. Robert Moses
Mr. R. M. Myers
National Council of State Garden Clubs, Inc.
National Cotton Council of America
National Farm Chemurgic Council
National Lumber Manufacturers' Assoc.
National Peanut Council, Inc.
National Research Council
National Research Council of Canada
Mr. R. A. Nemanick
New Hampshire, University of. Biological Institute
New Jersey State Horticultural Society
New York Assoc of Biology Teachers
New York Historical Society
Northwest Crop Improvement Assoc.
Dr. William H. Over
Pan American Sanitary Bureau
Pan American Union
S. B. Penick & Company
Mr. H. L. Penman
Pennsylvania University Library
Miss Emilie L. Platt
M. René Pomerleau
Mr. A. E. Porsild
Pratt Institute Library
Mr. Hugh M. Raup
Dr. George M. Reed
Riverside Public Library
Rubber Manufacturers Assoc , Inc.
Miss Hester M. Rusk
Prof Alfred Russell
Prof. Bryce Ryan
St. Bonaventure College
Miss Claire Sanders
Miss Ethel Sanders
Dr. A. Scharf
School Garden Association
School Nature League
J. F. Seagram & Sons, Inc.
Dr. H. W. Shimer
Sociedad Mexicana de Historia Natural
Sociedad Venezolana de Ciencias Naturales
Southern Methodist University
Stanford University Library
Stanford University Natural History Museum
Dr W. M. Stanley
Dr. W. C. Steere
Prof. Robert Stratton
Dr. Vincente Suárez Soto
Dr. Henry K. Svenson
Tennessee University Library
University of Texas
Mrs. Elizabeth H. Thomson
Prof. Henry W. Thurston, Jr.
Timber Engineering Company
Transylvania College
U. S. Golf Assoc. Green Section
Dr. Paul D. Voth
Miss Florence E. Wall
Wallerstein Laboratories
Prof. John Walton
West Virginia University Herbarium
Dr. P. R. White
Wilderness Society
Mr. Stuart Winston
University of Wisconsin, Botany Manual Fund
Mr. J. G. Wood
Dr. Albert Hazen Wright
Mr. L. C. Wyman
Yale University School of Forestry

## Department of Plants

### LIVING PLANTS

Bernhardt, Capt. A. A., Port Eads, La. 25 miscellaneous plants.
Bixby, Mr. Charles, Brooklyn, N. Y. 6 clumps *Dentaria laciniata.*
Bobbink & Atkins, Rutherford, N. J. 40 Sugar Maple seedlings, 2 *Correa pulchella*, 250 *Rosa multiflora*, 12 Standard Roses, 244 Roses in 58 varieties.
Chace, Mr. Franklin, New York, N. Y., 3 clumps of *Asclepias tuberosa.*
Conard Pyle Co., West Grove, Pa. 26 Roses in 13 varieties.
de Bole, Mr. Anthony A., New York, N. Y., Several dozen American Artichoke tubers.
De Tomasi, Mrs. J., Cold Spring Harbor, L. I. 288 Orchids in 30 species, 4 Bromeliads.
Flowerfield Bulb Farm, Flowerfield, L. I. 1 Peony.
Jackson & Perkins, Newark, N. Y. 58 Roses in 15 varieties.
Kittredge, Miss E. M., Vergennes, Vt. 26 miscellaneous plants in 18 genera.
Lewis, Mr. Allen, Basking Ridge, N. J. 5 Cereus, 1 Opuntia.
Meerloo, Mrs. L. S., Brooklyn, N. Y. 1 Pandanus.
Miller Gardens, Orlando, Fla. 50 Caladiums in 25 varieties.
Narodney, Lt. Leo. H., N. Y., N. Y. 6 *Myristica fragrans.*
Phillips, Dr. W., Great Neck, L. I. 15 Orchids in 6 species.
Platt, Mr. Rutherford, N. Y., N. Y. 1 clump *Sabatia Kennedyana.*
Silvers, Mr. R., N. Y., N. Y. 1 *Salvia rutilans.*
Thacher, Mrs. A. B., South Orange, N. J. 6 *Salix gracilistyla* Miguel.
Totty's, Madison, N. J. 132 Greenhouse Chrysanthemums in 45 varieties.
Traendly, Mr. F. H., Rowayton, Conn. 50 Roses "Mrs. F. D. R."
Tricker, Wm., Saddle River, N. J. 42 Tropical Waterlilies.
Wayman, R., Bayside, L. I. 1 hardy Fig.
White, Mr. Alain, Summerville, S. C. 3 *Petalostemum corymbosus.*
Winnefeld & Blume, Hackensack, N. J. 100 Poinsettia cuttings.
Wollny, Mr. W., Brooklyn, N. Y. 20 Caladiums in 7 varieties, 40 Gloxinias in 3 varieties.

### SEED PACKETS

Bernhardt, Capt. A. A., Port Eads, La. (6)
Dossick, Mr. J. J., N. Y., N. Y. (6)
Dowd, Lt. D., Camp LeJeune, N. C (1)
Doyle, Mr. C. B., Washington, D. C. (2)
Jones, Mr. A. D. T., Jamestown, R. I. (1)
Jones, Dr. D. F., New Haven, Conn. (1)
Murrill, Dr. W. A., Gainesville, Fla. (1)
Senior, Mr. R. M., Cincinnati, Ohio. (1)

## Phanerogamic Herbarium

Demeritt, Prof. H. B., 4 Picea specimens collected in Maine.
Ericson, Mr. Charles, 19 miscellaneous specimens collected in New York.
Hastings, Mr. G. T., 808 miscellaneous specimens collected in California.
Hevle, Miss F. M., 3 miscellaneous specimens collected in New York.
Holtzoff, Mrs Mary, 39 miscellaneous specimens collected in New York.
O'Neill, Rev. Hugh, 2 miscellaneous specimens collected in the Philippines.

## Cryptogamic Herbarium

Diddell, Mrs. W. D., 1 specimen of Hypopterygium collected in Florida.

## For the Department of Elementary Instruction

Coates, Mr. John C., Dahlias in different varieties for the children's garden.
Gager, Mrs. C. Stuart, Two gold medals as prizes for outdoor garden work; one framed photograph of Dr. Gager for the children's clubroom.
Garden Teachers Association, One prize cup competed for by the boys of the outdoor garden.
Shaw, Miss Ellen Eddy, Two gold honor pins for work in the children's garden.
Woman's Auxiliary, One prize cup, in memory of Mrs Glentworth R. Butler, competed for by the girls of the outdoor garden.

*Note:* Gifts of money ($164.53) from various sources have been added to the Funds of the Department and are included in the financial report.

## Miscellaneous

Gibson, Miss Gertrude, Brooklyn, N. Y., 250 flower pots, one ladder, and one roll of wire mesh.
Lawrence, Mrs. Herbert, Brooklyn, N. Y., 89 miscellaneous articles of laboratory equipment.
Metropolitan Museum of Art, New York City, about one-half ton of Tufa Rock.
National Coffee Department of Brazil, New York City, 1 book, "Travel in Brazil," and one "Atlas Estatistico do Brasil."
Nixon Nitration Works, Nixon, N. J., 2 plastic plates, displaying samples of objects made of cellulose acetate and cellulose nitrate.
Peabody Museum of Natural History, New Haven, Conn., 1 plastotype model of *Cycadeoidea fisheri.*
Perkins, Mrs. Charles E., Brooklyn, N. Y., 2 metal flower holders.

## APPENDIX 2

## PUBLICATIONS BY THE BOTANIC GARDEN PERSONNEL DURING 1943

**Ashwell, G. Elizabeth.**

9 abstracts for *Biological Abstracts.*

**Benedict, Ralph C.**

Genetics. *Brooklyn Bot. Gard. Record* **32**: 83. April.

Report of the Resident Investigator (Ferns) for 1942. *Brooklyn Bot. Gard. Record* **32**: 117, 118. April.

Dr. C. Stuart Gager. *American Fern Jour.* **33**: 143, 144. December.

**Cheney, R. H.**

Economic Plants. *Brooklyn Bot. Gard. Record* **32**: 83, 84. April.

Report of the Resident Investigator (Economic Plants) for 1942. *Brooklyn Bot. Gard. Record* **32**: 118. April.

Medical uses of drug plants cultivated in the Medicinal Plant Garden of the Brooklyn Botanic Garden. (In collaboration with C. W. Ballard and F. J. Pokorny.) *Brooklyn Bot. Gard. Record* **32**: 187–208. July.

Review of "The Green Earth" by Harold W. Rickett. *Gardeners' Chronicle of America* **47**: 213. August.

3 interviews on *Tea substitutes*, *Ersatz drinks*, and *Blossomades.*

**Doney, Charles F.**

4 articles on Shrubs and other woody plants, published in *Horticulture*, *Bulletin* of the *Brooklyn Institute of Arts and Sciences*, and *N. Y. Times.*

**Dorward, Margaret M.**

Paper white narcissus. *Gardeners' Chronicle.* November.

**Free, Montague.**

Pocket book of flower gardening. *Pocket Books, Inc.*, New York, N. Y.

City slickers: roses can endure urban surroundings. *Amer. Rose Ann. 1943:* 55–58.

Report of the Horticulturist for 1942. *Brooklyn Bot. Gard. Record* **32**: 107–112. April.

Twenty-two gardening articles in *The Home Garden* and 15 in the *New York Sun.*

**Gager, C. Stuart.**

Review of W. Stephen Thomas, "The amateur scientist." *Science* **97**: 44–45. January 8.

Book notice of Selman A. Waksman, "The peats of New Jersey and their utilization." *Ecology* **24**: 134. January.

Book notice of Bennett and Pryor, "This land we defend." *Ecology* **24**: 134. January.

Thirty-second annual report of the Brooklyn Botanic Garden: Report of the director. *Brooklyn Bot. Gard. Record* **32**: 43–74.

Review of Sverdrup, Johnson, and Fleming, "The oceans: their physics, chemistry, and general biology." *Ecology* **24**: 271. April.

Brooklyn Botanic Garden and the schools. *Chronica Botanica* **7**: 308. Spring, 1943.

**Graves, Arthur Harmount.**

Spruces of the eastern United States. *School Nature League Bulletin.* Series 13. No. 6. National Audubon Society, N. Y. C. February.

Making new chestnut trees. *Brooklyn Central* **42**: 4–16. February.

Report of the Curator of Public Instruction for 1942. *Brooklyn Bot. Gard. Record* **32**: 84–91. April.

Chestnut breeding work in 1942. *Brooklyn Bot. Gard. Record* **32**: 78–80. April.

Botany. Revision service (for 1942). *Colliers National Encyclopedia.* April.

A brief historical survey of the use of plants in medicine. *Brooklyn Bot. Gard. Record* **32**: 169–186. July.

5 articles on items of interest in the Brooklyn Botanic Garden. In the *Bulletin* of the *Brooklyn Institute of Arts and Sciences.*

65 articles on events at the Brooklyn Botanic Garden, for metropolitan newspapers.

2 abstracts for *Biological Abstracts.*

**Gundersen, Alfred.**

Flower structure and the classification of dicotyledons. *Brooklyn Bot. Gard. Record* **32**: 81–82. April.

Report of the Curator of Plants for the Year 1942. *Brooklyn Bot. Gard. Record* **32**: 96–100. April.

Flower forms and groups of dicotyledons. *Bull. Torrey Bot. Club* **70**: 511–517. September.

**Jordan, William E.**

Report on the Library for 1942. *Brooklyn Bot. Gard. Record* **32**: 114–117. April.

A short list of works in the Library of the Brooklyn Botanic Garden dealing with the early use of plants in medicine. *Brooklyn Bot. Gard. Record* **32**: 208–209. July.

**Reed, George M.**

Plant Pathology. *Brooklyn Bot. Gard. Record* **32**: 75–78. April.

Melanopsichium on *Polygonum aviculare. Mycologia* **35**: 654, 655. December.

Phytopathology—1867–1942. *Torreya* **43**: 155–169. December.

**Shaw, Ellen Eddy.**

Annual Report of the Curator of Elementary Instruction. *Brooklyn Bot. Gard. Record* **32**: 91–96. April.

3 articles on children's gardening, published in *The Home Garden.*

**Shaw, Ellen Eddy, Michalena LeFrere Carroll, and Elsie Twemlow Hammond.**

Our Boys and Girls Club. *Educational series, Dept. of Elementary Instruction.* April.

**Shaw, Ellen Eddy and Margaret M. Dorward.**

Selection and care of plants in the classroom. *School Nature League Bulletin.* October.

**Svenson, Henry K.**

Report of the Curator of the Herbarium for 1942. *Brooklyn Bot. Gard. Record* **32**: 102–107. April.

Modern taxonomy and its relation to geography. *Torreya* **43**: 44–49. July.

Flora of Panama. Part II. Fascicle 2 (Cyperaceae). *Ann. Mo. Bot. Gard.* **30**: 281–326. September.

**Utter, L. Gordon.**

C. Stuart Gager. *Gardeners Chronicle of America* **47**: Chronicle Insert—September.

Gardening for Victory. 30 weekly articles for *The Gateway*, Floral Park, N. Y.

Victory Garden Tips. 25 weekly articles (with C. F. Wedell).

## APPENDIX 3

## TALKS, LECTURES, ADDRESSES, AND PAPERS GIVEN BY THE BOTANIC GARDEN PERSONNEL DURING 1943

**By G. Elizabeth Ashwell:**

April 30. *Our common trees.* Garden Club of New Utrecht Reformed Church.

July 17. *Economic plants in wartime.* New Canaan Garden Club.

2 talks on *Soil erosion*, and *Mountains*, before biology class and nature club.

**By R. H. Cheney:**

February 8. *Wartime flavors from United States plants.* Illustrated by lantern slides in color. East Orange, N. J. Garden Club.

February 27. *Thirst quenchers for the duration.* Illustrated by lantern slides and demonstration material. New York Botanical Garden (Saturday Afternoon Lecture Series).

**By Elizabeth Clarke:**

October 5. *Bulbs for spring bloom.* Garden Center of New Rochelle.

November 8. *House plants.* Brooklyn Heights Garden Club.

12 talks on Victory Gardens.

**By Charles F. Doney:**

October 6. *Flowering shrubs.* Rockville Center Garden Club.

December 3. *Christmas evergreens.* Brooklyn Heights Garden Club.

2 talks, one on *Trees and Shrubs* and one on the *Brooklyn Botanic Garden.*

**By Margaret M. Dorward:**

5 talks on *Victory Gardens* before various organizations.

2 lectures in the special *Victory Garden Courses* given at Bloomingdale Bros., Inc., for the A.W.V.S.

**By Montague Free:**

18 talks on *Victory Gardens* and 6 talks on various subjects to Garden Clubs and other organizations.

**By C. Stuart Gager:**

April 8. *Larger aspects of the activities of the Brooklyn Botanic Garden,* with statistics, during the first 32 years. Brooklyn Institute Trustees. Academy of Music, Brooklyn.

April 15. *Accomplishments and needs of the Brooklyn Botanic Garden,* 1942–43. Woman's Auxiliary of the Garden. At the Garden.

**By Arthur Harmount Graves:**

January 16. *Breeding the chestnut.* Class of Prof. Martin L. Robertson at N. Y. Univ. on Modern Advances in Science.

March 8. *Medicinal Plants.* At the Garden.

March 25. *Food Plants of the World. I. Cereals.* P. S. 42, Manhattan.

April 27. *The Brooklyn Botanic Garden.* Bayside Garden Club.

May 18. *Forestry.* P. S. 42, Manhattan.

May 26. *Chestnut breeding.* Stuyvesant H. S., Manhattan.

October 19. *The work of the Brooklyn Botanic Garden.* South Strathmore Garden Club. At the Garden.

October 27. *Soil conservation.* Class in Hygiene and Public Health from Brooklyn College. At the Garden.

December 11. *Breeding chestnut trees.* Saturday morning Children's Class. At the Garden.

December 18. *How we are defeating the chestnut blight.* Class in Modern Advances in Science. N. Y. Univ.

**By Alfred Gundersen:**

March 31. *Classifying plants.* N. J. State Teachers College. At the Garden.

May 20. *The history of food plants.* Contemporary Club. At the Garden.

**By Frances M. Miner:**

4 talks on *Victory Gardens.*

4 talks on *Children's Gardens.*

3 talks on gardening subjects.

1 lecture before Bloomingdale Bros., Inc. employees at the Greater New York A.W.V.S. Headquarters.

**By George M. Reed:**

April 20. *Disease resistance in plants, with particular reference to the genetical aspects.* Federal Plant Quarantine Club of New York.

May 8. *Genetics of oat smut inheritance.* Biology Class in the Teaching of Biological Science, New York University. At the Garden.

May 10 and 11. *Oat smut experiments.* Biology class, Brooklyn College. At the Garden.

**By Hester M. Rusk:**

July 14 and October 25. *Edible wild plants.* Flushing Garden Club and Three Village Garden Club.

November 15. *Plant ecology.* Madison Garden Club, Madison, N. J.

November 28. *Wild flowers and their fruits.* Barnard Club, New York.

**By Ellen Eddy Shaw:**

March 28. *The children's garden at the Brooklyn Botanic Garden.* St. Christopher's School, Dobbs Ferry, N. Y.

June 9. *The garden check-up.* Three Village Garden Club, Syosset, L. I.

October 2. *The educational value of gardening for children.* Queensboro Federation of Mothers' Clubs, Inc., at the Hotel Pennsylvania.

November 17. *In memory of Dr. Gager.* Woman's Auxiliary of the Brooklyn Botanic Garden.

November 19. *Thanksgiving.* Girls' High School.

November 23. *The Brooklyn Botanic Garden.* Woman's Guild, Bedford Presbyterian Church.

4 *Graduation addresses.*

5 *Victory Garden talks.*

4 talks on *Children's gardens.*

3 talks on the *Brooklyn Botanic Garden.*

7 lectures in special *Victory Garden Courses* at Bloomingdale Bros., Inc. for the A.W.V.S., and the Board of Education and Boy Scouts at the Garden.

**By Henry K. Svenson:**

February 12. *The species problem.* Sigma Delta Epsilon Scientific Society. At the Cornell Club Rooms, Barbizon Hotel, New York, N. Y.

April 21. *Plants of a Long Island pond.* Torrey Botanical Club. At the Garden.

5 talks on *Ecuador and Peru.* Before various organizations.

**By S. R. Tilley:**

April 19. *Rose growing.* Strathmore Village Garden Club, Manhasset, L. I.

**By L. Gordon Utter:**

40 talks on *Victory Gardens* before various organizations.

## APPENDIX 4

### RADIO TALKS GIVEN DURING 1943

*From Station WNYC:*

| | | | |
|---|---|---|---|
| January | 8. | The story of rubber. | Dr. Graves |
| January | 22. | The story of tea and coffee. | Miss Ashwell |
| February | 5. | Garden soil and its problems. | Miss Shaw |
| February | 19. | Sugar and sugar substitutes. | Dr. Gundersen |
| March | 5. | Planning the vegetable garden. | Mr. Free |
| March | 19. | Seeds to choose for the children's garden. | Miss Miner |
| April | 2. | Planting the vegetable garden. | Miss Shaw |
| April | 16. | Try growing herbs. | Miss Van Brunt |
| April | 30. | Flowers for victory. | Miss Clarke |
| May | 14. | Plant protection and our chemical supplies. | Dr. Utter |
| May | 28. | Substitutes for coffee and tea. | Miss Rusk |
| June | 11. | Summer care of the victory garden. | Miss Shaw |
| June | 25. | Spices and substitutes. | Mr. Doney |
| July | 13. | Keep your victory garden growing. | Mr. Free |
| October | 15. | Plants and people. | Mr. Free |
| October | 29. | How did your victory garden grow? | Dr. Utter |
| November | 12. | The long, long way from love apple to victory garden tomato. | Mr. Doney |
| November | 26. | "Every herb bearing seed . . . to you it shall be for meat." | Miss Rusk |
| December | 10. | Plants for Christmas. | Miss Shaw |

*From Station WOR:*

| | | | |
|---|---|---|---|
| April | 20. | An interview. | Mr. Free |
| October | 12. | Battle of the Boroughs Quiz Program. | Miss Shaw |

*From Station WEAF:*

| | | | |
|---|---|---|---|
| April | 17. | Victory Garden Program from the Schwab Estate. | Mr. Free |

*From Station W75NY:*

| | | | |
|---|---|---|---|
| March | 4. | An interview. | Mr. Free |

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## APPENDIX 5

### FIELD TRIPS CONDUCTED, 1943

April 11. Torrey Botanical Club. Brooklyn Botanic Garden; for important economic plants outdoors and in the conservatories. Dr. Graves and Dr. Gundersen

June 5. Torrey Botanical Club. Brooklyn Botanic Garden and Prospect Park to see rare and exotic trees. Miss Ashwell
September 26. Torrey Botanical Club. Van Cortlandt Park. Dr. Graves
October 10. Torrey Botanical Club. Richmond, S. I. Miss Rusk
October 17. Torrey Botanical Club. Gymnosperms at the Brooklyn Botanic Garden. Dr. Graves and Dr. Gundersen

## APPENDIX 6

### MEETINGS OF ORGANIZATIONS AT BROOKLYN BOTANIC GARDEN, 1943

January 13. O.C.D. Leaders.
January 20. O.C.D. Leaders.
January 27. O.C.D. Leaders.
February 3. O.C.D. Leaders.
February 10. O.C.D. Leaders.
April 11. Torrey Botanical Club.
April 15. Woman's Auxiliary, Brooklyn Botanic Garden.
April 21. Torrey Botanical Club.
May 4. American Herb Society.
May 4. Winters Night Club.
May 4. Brooklyn Section, Public School Kindergarten Association.
May 5. N.S. D.A.R., '76 Chapter.
May 8. D.A.R., Battle Pass Chapter.
May 8. Association of Kew Gardeners in America.
May 12. North Country Garden Club.
May 20. Contemporary Club.
June 1. American Nature Study Club.
June 11. N.S.D.A.R., Ellen Hardin Walworth Chapter.
June 24. Brooklyn Nature Club.
August 31. Kings County War Saving Staff.
September 23. Conference on Fruit and Vegetable Storage.
October 5. Torrey Botanical Club.

October 5. Department of Natural History, Brooklyn Institute.
October 17. Torrey Botanical Club.
October 19. Strathmore Garden Club.

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## APPENDIX 7

## STATISTICS OF SCHOOL SERVICE

| | 1942 | 1943 |
|---|---|---|
| Loan Lectures (Lantern Slides, etc.) | | |
| No. of sets lent | 26 | 22 |
| No. of teachers involved | 72 | 122 |
| No. of pupils attending | 3,084 | 6,305 |
| Material Supplied | | |
| Total number of requests from schools | 513 | 347 |
| Number of different institutions | 226 | 184 |
| High Schools and High School Annexes | | |
| Brooklyn (Total No. 38) | 16 | 18 |
| Queens (Total No. 27) | 7 | 6 |
| Manhattan (Total No. 53) | 5 | 7 |
| Other Boroughs (Total No. 32) | 4 | 6 |
| Junior High Schools (Total in Brooklyn 31) | 4 | 8 |
| Colleges and Universities (Total in Brooklyn 7) | 12 | 7 |
| Elementary Schools | | |
| Brooklyn (Total No. 227) | 125 | 78 |
| Queens (Total No. 147) | 8 | 5 |
| Manhattan (Total No. 126) | 9 | 7 |
| Other Boroughs (Total No. 150) | 12 | 21 |
| Private and Parochial Schools | 12 | 12 |
| Other Institutions | 12 | 9 |
| Number of potted plants for nature study | 2,371 | 1,235 |
| Number of Petri dishes filled with sterilized agar | 695 | 381 |
| Total number of teachers supplied with material | 5,518 | 5,026 |
| Total number of pupils reached | 256,586 | 208,542 |
| Living Plants Placed in School Rooms | | |
| No. of schools | 23 | 29 |
| No. of plants | 663 | 1,002 |
| No. of teachers involved | 451 | 882 |
| No. of pupils reached | 15,710 | 32,370 |
| Plants Distributed (Raised in Classes) | 38,309 | 24,765 |
| No. of persons taking plants | 1,216 | 859 |
| Total number of schools represented | 210 | 149 |

| | | |
|---|---|---|
| Seed Packets for Children | | |
| No. of schools | 663 | 480 |
| No. of teachers | 16,380 | 86,230 |
| No. of pupils | 438,551 | 440,756 |
| No. of packets | 1,315,653 | 1,322,268 |
| Exhibits Provided | | |
| No of exhibits | 9 | 19 |
| Viewed by | 119,665 | 151,250 |

---

## APPENDIX 8

## STATISTICS RELATING TO LIVING PLANTS

| | Species or Varieties | Plants |
|---|---|---|
| *Living Plants Received:* | | |
| By collection | 1 | 1 |
| By exchange | 69 | 228 |
| By gift | 292 | 1,541 |
| By purchase | 60 | 1,034 |
| Total | 322 | 2,804 |

### SEED EXCHANGE

| | |
|---|---|
| *Seed Packets Received:* | |
| By exchange | 81 |
| By gift | 19 |
| By purchase | 137 |
| Total | 237 |
| *Seed Packets Distributed:* | |
| By exchange | 525 |
| By gift | 3 |
| Total | 528 |
| *Plants and Cuttings Distributed:* | |
| By exchange | 6,654 |
| By gift | 1,022 |
| Total | 7,676 |

# APPENDIX 9

## HERBARIUM ACCESSIONS AND DISTRIBUTION

### Phanerogamic Herbarium

*Accessions:*

*By Gift:*

| | | |
|---|---|---|
| Demeritt, Prof. H. B., University of Maine, Orono, Maine | 4 | |
| Ericson, Mr. Charles, Brooklyn, N. Y. | 19 | |
| Hastings, Mr. George T., Santa Monica, Calif. | 808 | |
| Hevle, Miss F. M., New York, N. Y. | 3 | |
| Holtzoff, Mrs. Mary. New York, N. Y. | 39 | |
| O'Neill, Rev. Hugh, The Catholic University of America, Washington, D. C. | 2 | 875 |

*By Exchange:*

| | | |
|---|---|---|
| Bazuin, Mr. C. W., Grand Rapids, Mich. | 171 | |
| Beetle, Dr. Alan A., Agricultural Experiment Station, University of California, Davis, Calif. | 130 | |
| Field Museum of Natural History, Chicago, Ill. | 18 | |
| Gray Herbarium, Cambridge, Mass. | 200 | |
| Hanes, Mr. C. R., Schoolcraft, Mich. | 2 | |
| Howell, Mr. J. T., California Academy of Sciences, San Francisco, Calif. | 1 | |
| Lundell, Dr. C. L., University of Michigan, Ann Arbor, Mich. | 21 | |
| O'Neill, Rev. Hugh, The Catholic University of America, Washington, D. C. | 43 | |
| Pennell, Dr. F. W., The Academy of Natural Sciences, Philadelphia, Pa. | 228 | |
| Peters, Mr. G. H., Freeport, Long Island, N. Y. | 2 | |
| Rosengurtt, Mr. Bernardo, Monzon Heber, Estacion Juan Jackson, Uruguay, South America | 61 | |
| Sharp, Dr. A. J., University of Tennessee, Knoxville, Tenn. | 150 | |
| U. S. Department of the Interior, Washington, D. C. | 2 | |
| U. S. Forest Service, Washington, D. C. | 2 | |
| U. S. National Herbarium, Washington, D. C. | 68 | |
| Whitehouse, Dr. Eula, University of Texas, Austin, Texas | 13 | 1,112 |

*By Collection:*

| | | |
|---|---|---|
| Ashwell, Miss G. Elizabeth, Brooklyn Botanic Garden | 1 | |
| Graves, Dr. A. H., Brooklyn Botanic Garden | 5 | |
| Rusk, Miss H. M., Brooklyn Botanic Garden | 1 | 7 |

*By Purchase:*

| | | |
|---|---|---|
| Hastings, Mr. George T., Santa Monica, Calif. | 135 | |
| Kittredge, Miss E. M., Vergennes, Vt. | 166 | 301 |
| | | 2,295 |

*Distribution:*

*By Exchange:*

| | | |
|---|---|---|
| Blake, Dr. S. F., Arlington, Va. | 1 | |
| Davis, Prof. R. J., University of Idaho, Southern Branch, Pocatello, Idaho | 3 | |
| Gray Herbarium, Cambridge, Mass. | 107 | |
| Lepage, Rev. Ernest, École d'Agriculture, Rimouski, Québec, Canada | 48 | |
| New York Botanical Garden, Bronx Park, New York, N. Y. | 260 | |
| Ogden, Dr. E. C., University of Maine, Orono, Me. | 13 | |
| Peters, Mr. G. H., Freeport, Long Island, N. Y. | 28 | |
| Underwood, Dr. J. K., University of Tennessee, Knoxville, Tenn. | 71 | |
| U. S. National Herbarium, Washington, D. C. | 186 | 717 |

*By Gift:*

| | | |
|---|---|---|
| Blake, Dr. S. F., Arlington, Va. | 2 | |
| Logue, Dr. E. G., Williamsport, Pa. | 2 | |
| Otis, Dr. M. H., Moline, Ill. | 15 | 19 |
| | | 736 |

### CRYPTOGAMIC HERBARIUM

*Accessions:*

*By Gift:*

| | |
|---|---|
| Diddell, Mrs. W. D., Jacksonville, Florida | 1 moss |
| *By Collection:* | 2,105 fungi |

## APPENDIX 10

## REPORT OF PHOTOGRAPHIC WORK

| | |
|---|---|
| Negatives on file December 31, 1942 | 10,600 |
| Negatives accessioned during 1943 | 200 |
| Total negatives on file December 31, 1943 | 10,800 |
| Lantern slides on file December 31, 1942 | 7,130 |
| Lantern slides accessioned during 1943 | 95 |

| | | |
|---|---|---|
| Total lantern slides on file December 31, 1943 | | 7,225 |
| Prints on file December 31, 1942 | | 10,600 |
| Prints made during 1943 | 768 | |
| Prints used or distributed | 568 | |
| Prints filed during 1943 | | 200 |
| Total prints on file, December 31, 1943 | | 10,800 |
| Enlargements made | | 79 |

## APPENDIX 11

## REPORT ON BROOKLYN BOTANIC GARDEN PUBLICATIONS, 1943

### *Ecology*

Official Organ of the Ecological Society of America. Quarterly. Volume XXIV comprised 32 papers (besides reviews, proceedings, and miscellaneous matter), 520 pages, 1 plate and 157 text figures (as against 35 papers, 500 pages, 2 plates and 182 text figures in 1942). The circulation at the close of the fiscal year (November 30, 1943) was 893 as against 951 one year ago.

The annual budget was $7,656.36, the credit balance $2,126.39, and assets over liabilities $2,135.29 (as against $6,189.78, $2,631.56 and $1,704.09 assets over liabilities in 1942), plus the value of back sets and volumes on hand. Dr. Henry K. Svenson continued on the editorial board as the Brooklyn Botanic Garden representative. Dr. Thomas Park, of the University of Chicago, continued as Zoological Editor. Dr. Charles E. Olmsted, of the University of Chicago, continued as Botanical Editor.

### *Genetics*

In Cooperation with "Genetics, Incorporated." Bimonthly. Volume XXVIII comprised 36 papers, 542 pages, 7 plates and 81 text figures (as against 39 papers, 664 pages, 7 plates and 123 text figures in 1942). At the close of the fiscal year (November 30, 1943) the circulation was 565, the annual budget $8,104.33, and the credit balance $4,022.57 (as against 585, $8,754.78, and $3,249.11 in 1942), plus the value of back sets and volumes on hand. Dr. M. M. Rhoades, of Columbia University, continued as Managing Editor.

### *Brooklyn Botanic Garden Record*

Quarterly. Volume XXXII comprised 232 pages. The April number comprised the Annual Report. The circulation of the Record at the close of the year was 1,299.

### *Leaflets*

No *Leaflets* were issued.

### *Contributions and Memoirs*

Numbers 98 and 99 of the *Contributions* were published. No *Memoir* was published.

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| Donors | | 29 |
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| Through Other Departments | 170 | 186 |
| Contributing Members | | 40 |
| Sustaining Members | | |
| Through the Botanic Garden | 19 | |
| Through Other Departments | 152 | 171 |
| Annual Members | | 347 |
| Total, as of December 31, 1943 | | 877 |

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**THE MUSEUM** offers its members private views of exhibitions, admission to Museum courses, phonograph records and prints from its lending libraries, and docent services. Also: five Museum publications free of charge and other Museum publications at reduced prices.

WALTER H. CRITTENDEN, *Chairman, Governing Committee* MRS. LAURANCE P. ROBERTS, *Director.*

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**THE BROOKLYN ACADEMY OF MUSIC** is owned and operated by the Brooklyn Institute. Its Opera House, Music Hall, and Ballroom may be rented for concerts, plays, lectures, school ceremonies, dances, and other events.

WILLIAM T. HUNTER, *Chairman, Building Committee.* HERBERT T. SWIN, *Building Superintendent.*

# PRIVILEGES OF MEMBERSHIP IN THE BROOKLYN BOTANIC GARDEN

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The Brooklyn Botanic Garden renders a public service in its endeavor to advance a knowledge of plants, affording educational advantages, and carrying on fundamental investigations. Members of the Garden have the opportunity of furthering these aims.

Special membership privileges are also offered as follows:

1. Advice on the choice and care of ornamental trees, shrubs, and herbaceous plants, and the best ways to grow plants successfully, involving methods of culture, and control of insect and fungous pests.
2. The naming of botanical specimens submitted for determination.
3. Periodical distribution of surplus ornamental plant material and seeds.
4. Invitations for self and friends to the Annual Spring Inspection, and to spring and fall "Flower Days"; cards of admission to all exhibitions and openings preceding the admission of the general public, and to receptions; admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Services of a guide (by appointment) for self and party, when visiting the Garden.
6. Free tuition in all courses of instruction, except that in laboratory courses a small fee is charged to cover cost of materials, etc.
7. The Library and Herbarium are available for consultation.
8. Announcement cards concerning plants in bloom and the activities of the Garden are sent to members from time to time.
9. As part of its services, the Brooklyn Botanic Garden issues publications of general horticultural interest, and technical papers based upon the researches carried on at the Garden. Special *Guides* to the plantations and collections, *Leaflets* of popular information, and the quarterly *Record,* which includes the *Annual Report* of the Garden's activities, are sent free to members.
10. Membership privileges in other botanic gardens and museums outside of Greater New York are offered to our members when they are visiting other cities and on presentation of Brooklyn Botanic Garden membership card.

## CLUB MEMBERSHIPS

For many years the Botanic Garden has had the pleasure of cooperating in numerous ways with Garden Clubs, Women's Clubs, and other organizations of the Metropolitan area, and a plan has been adopted whereby such organizations may become definitely identified with the work of the Garden in promoting an interest in plant life and horticulture, as follows:

*Annual Memberships.*—Garden Clubs or other organizations may qualify as Annual Members of the Garden on election by the Board of Trustees and payment of the annual membership fee of Ten Dollars. Each annual member club may designate one of its officers or other member to receive such invitations, notices, and publications as go to individual annual members and to represent the club at all Botanic Garden functions, including "Flower Days" and the annual Spring Inspection in May.

The Club may also have the following privileges:

*a.* *The services of a Botanic Garden docent or guide* for a tour of the plantations or conservatories, followed by tea. No parties of less than six adults will be conducted. Schedule for such events must be arranged for in advance, at dates mutually convenient to the Botanic Garden and the Club.

*b.* *One extra-mural lecture a year* by a member of the Garden staff. The Garden supplies, on request, a list of staff members available for outside lectures.

Arrangements will be facilitated if the Club will, with each request, designate at least two names.

*c.* One member of the club is entitled annually to free tuition in courses of instruction for which tuition is charged to non-members. In Laboratory Courses a nominal fee is charged to cover cost of material.

*Sustaining Memberships.*—Any club or other organization may become a Sustaining Member of the Garden on election by the Board of Trustees and annual payment to the Garden of the sustaining membership fee of Twenty-five Dollars.

Sustaining membership clubs enjoy the full privileges of annual membership, not only in the Botanic Garden but also in the Brooklyn Museum and The Institute at the Academy of Music. They may designate three members who may receive free tuition in Botanic Garden courses of instruction for which tuition is charged to non-members. They are entitled each year to two extra-mural lectures free, by a lecturer chosen from the Garden's list of lecturers.

## OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
Berkshire Museum, Springfield, Mass.
Boston Society of Natural History, Boston, Mass.
Buffalo Museum of Science, Buffalo, N. Y.
California Academy of Sciences, San Francisco, Calif.
Carnegie Museum, Pittsburgh, Pa.
Charleston Museum, Charleston, S. C.
Cranbrook Institute of Science, Bloomfield Hills, Mich.
Everhart Museum of Natural History, Science and Art, Scranton, Pa.
Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
Field Museum of Natural History, Chicago, Ill.
Los Angeles Museum, Los Angeles, Calif.
Massachusetts Horticultural Society, Boston, Mass.
Missouri Botanical Garden, St. Louis, Mo.
Newark Museum, Newark, N. J.
New York State Museum, Albany, N. Y.
Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
Pennsylvania Horticultural Society, Philadelphia, Pa.
Philadelphia Commercial Museum, Philadelphia, Pa.
Southwest Museum, Los Angeles, Calif.

# CLASSES OF MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following eight classes of membership may be taken out through the Botanic Garden:

| | | |
|---|---|---|
| 1. | Annual, by annual payment of ....... | $ 10 |
| 2. | Sustaining, by annual payment of .... | 25 |
| 3. | Contributing, by annual payment of .. | 100 |
| 4. | Life, by one payment of ............. | 500 |
| 5. | Permanent, by one payment of ....... | 2,500 |
| 6. | Donor, by one payment of ........... | 10,000 |
| 7. | Patron, by one payment of .......... | 25,000 |
| 8. | Benefactor, by one payment of ....... | 100,000 |

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to eight carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members also enjoy the special privileges indicated on a preceding page.

Further information concerning membership may be had by addressing The Director, Brooklyn Botanic Garden, Brooklyn, N. Y., or by personal conference by appointment. Telephone, Main 2-4433.

NOTE: *Contributions to the Brooklyn Botanic Garden, through membership dues or otherwise, constitute proper deductions under the Federal and New York State Income Tax Laws.*

# FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

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## Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which said sum to be used exclusively for the educational and scientific work of the Brooklyn Botanic Garden.

## Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

## Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which sum to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as the ..........................................................fellowship.

## Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *

..........................................................................

..........................................................................

* The following additional purposes are suggested for which endowment is needed:

1. Botanical research.
2. Publishing the results of botanical research.
3. The endowment of special gardens and collections.
4. The Library.
5. The Herbarium.
6. Extending and enriching our work of public education.
7. The purchase and collecting of plants.
8. Popular botanical publication. .
9. Illustrations for publications and lectures.
10. The beautifying of the grounds.

## VII

# THE BOTANIC GARDEN AND THE CITY

THE BROOKLYN BOTANIC GARDEN, established in 1910, is a Department of the Brooklyn Institute of Arts and Sciences. It is supported in part by municipal appropriations, and in part by private funds, including income from endowment, membership dues, and special contributions. Its articulation with the City is through the Department of Parks.

The City owns the land devoted to Garden purposes, builds, lights, and heats the buildings, and keeps them in repair, and includes in its annual tax budget an appropriation for other items of maintenance. One third of the cost of the present buildings (total cost, about $300,000), and other permanent improvements to a total of more than $281,000, has been met from private funds.

Appointments to all positions are made by the director of the Garden, with the approval of the Botanic Garden Governing Committee, and all authorized expenditures for maintenance are made in the name of the private organization, from funds advanced by the Institute, which, in turn, is reimbursed from time to time by the City, within the limits, and according to the terms of the annual Tax Budget appropriation. Certain salaries are paid, in whole or in part, from private funds.

All plants have been purchased with private funds since the Garden was established. In addition to this, it has been the practice of the Garden, from its beginning, to purchase with private funds all publications for the library, all specimens for the herbarium, all lantern slides and photographic material, and numerous other items. These collections, available without charge for public use, are the property of the Trustees.

The interest on One Million Dollars at the rate of 3.5 per cent, added to the present private funds income, would restore that income to the 1930 figure. The director will be glad to give full information as to the uses for which such additional income is needed.

## REGULATIONS CONCERNING PHOTOGRAPHING, PAINTING, AND SKETCHING

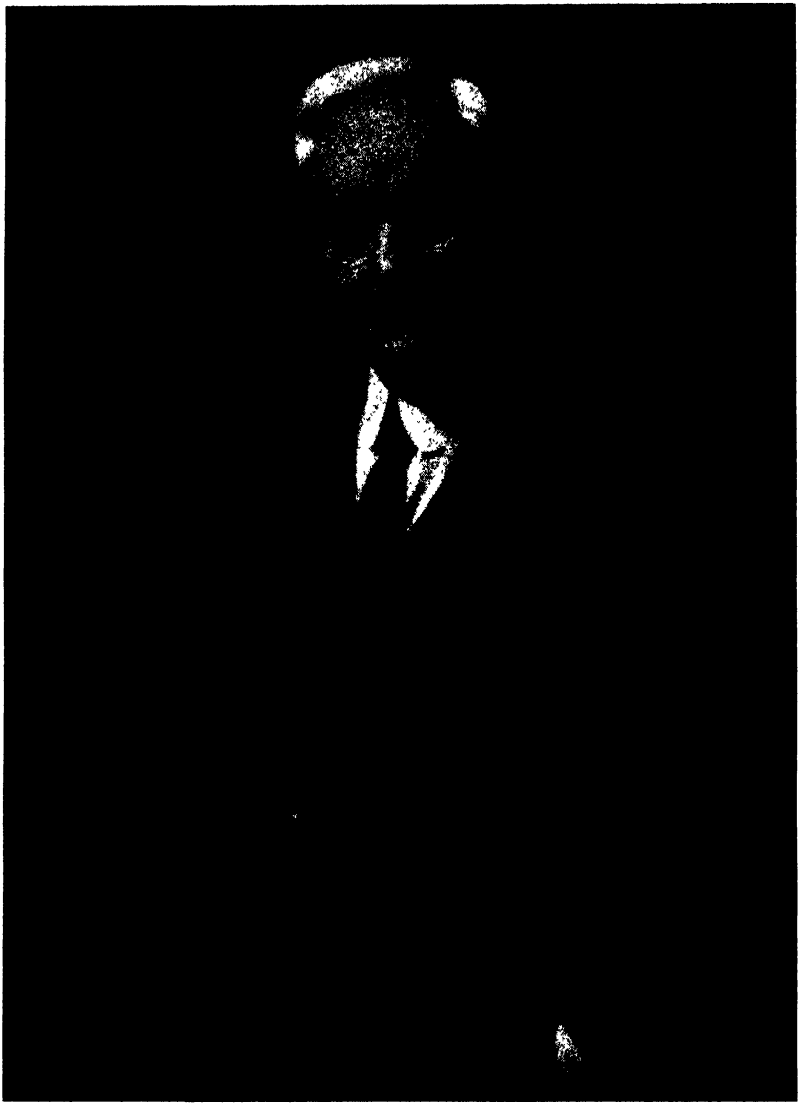
1. No permit is required for photographing with a hand camera, or for sketching or painting without an easel on the Grounds or in the Conservatories.

2. Sketching and painting with an easel and the use of a camera with tripod are not allowed in the Oriental Garden, the Rose Garden, the Local Flora Section (Native Wild Flower Garden), nor the Conservatories at any time without a permit. No permits are given for use after 12 o'clock noon on Sundays and holidays.

3. Artists, and the public in general, may not bring into the Botanic Garden chairs, stools, or anything to sit in or on.

4. Holders of permits must not set up tripod cameras nor easels in such a way as to involve injury to living plants or lawns, nor to cause an obstruction to traffic on paths or walks.

5. Application for permits should be made at the office of the Director, Laboratory Building, Room 301, or by mail (1000 Washington Avenue), or by telephone (MAin 2-4433).



*Blackstone, N. Y.*

C. Stuart Gager

DECEMBER 23, 1872—AUGUST 9, 1943

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXXIII APRIL, 1944 NO. 2

# C. STUART GAGER

## AND THE

# BROOKLYN BOTANIC GARDEN

### EVENTS LEADING TO THE FOUNDING OF THE GARDEN

> "A botanic garden and arboretum for the collection and culture of plants, flowers, shrubs and trees, the advancement of botanical science and knowledge, and the prosecution of original researches therein and in kindred subjects; for affording instruction in the same, and for the prosecution and exhibition of ornamental and decorative horticulture and gardening, and for the entertainment, recreation and instruction of the people . . ." New York State Law, 1897.

The proposal for the establishment of a botanic garden in Brooklyn was promoted actively during the last decade of the nineteenth century by officials and members of the Brooklyn Institute of Arts and Sciences. The first concrete move was the appointment of a committee of the Institute on February 26, 1897, to consider the advisability of drawing up a New York State Legislative Act reserving the East Side Lands, an area of about thirty-nine acres, then known as Institute Park, for a botanic garden and arboretum. On March 5, the Board of Trustees approved an act presented by the committee and, soon thereafter, Hon. George W. Brush, M.D., a Senator from Brooklyn, introduced a bill in the State Legislature providing for carrying out the provisions of the act, this bill being passed on May 18.

A second step was taken in October, 1898, when Professor Franklin W. Hooper was authorized to prepare a form of amendment to the constitution of the Institute regarding the appointment of a standing committee of the Board of Trustees, to be known as the Committee on Botanic Garden and Arboretum. The amend-

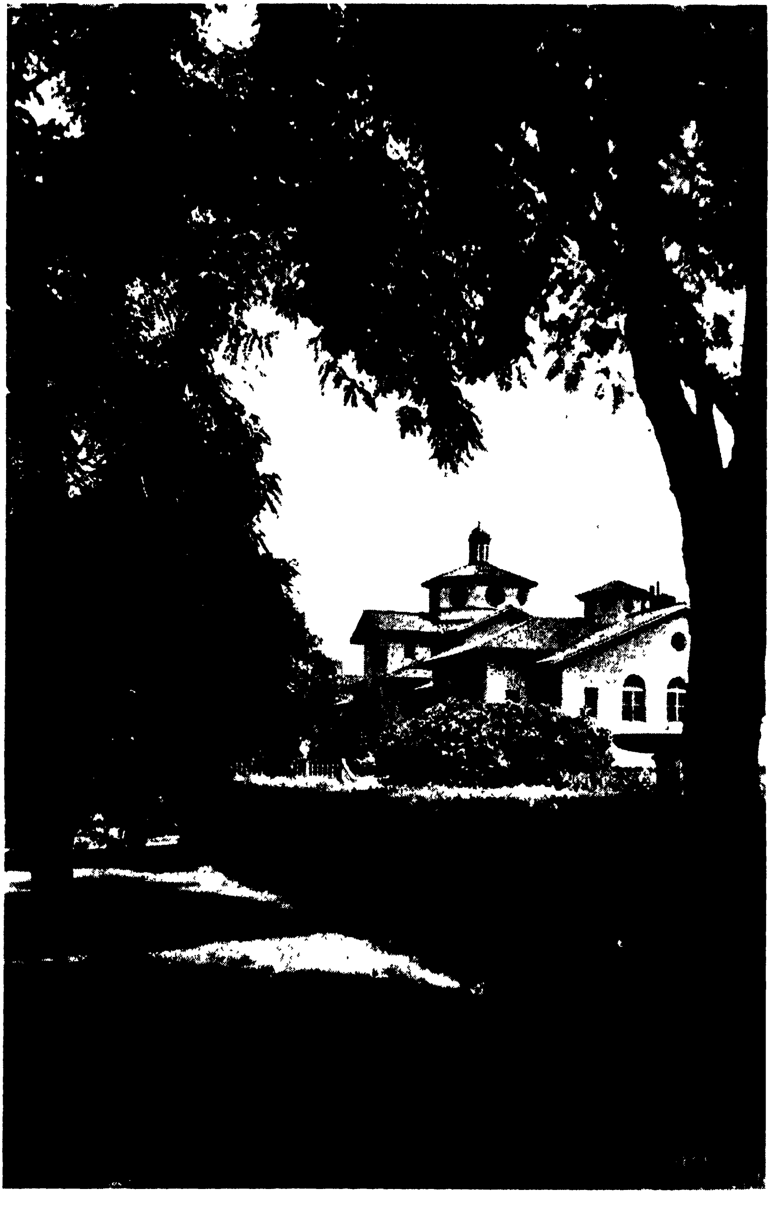


FIG. 1. The Laboratory Building, July 1, 1936. (9232)

ment was prepared and adopted by the Board, and the first Botanic Garden committee* appointed.

Little progress was made toward establishing the garden and arboretum for several years. At a meeting of the Board of Trustees of the Institute, held in June, 1905, a communication was received from Mr. Alfred T. White stating that some friends of the Institute had authorized him to offer to it the sum of $25,000, to be used in equipping a scientific botanic garden, whose primary purpose should be the teaching of botany to students in the public and private schools in the city and to the general public, provided such a garden be established on the grounds adjacent to the Museum.

This was the final impetus for the establishment of the Garden. A bill, introduced in the State Legislature, authorizing the City to establish and maintain a garden and arboretum in Institute Park, was approved by the New York State Legislature and signed by the Governor on May 24, 1906.

On December 28, 1906, the first offer made by Mr. White was changed to a subscription of $50,000, made under the same conditions, and in the spring of 1907 a form of agreement between the City and the Institute was prepared, and approved by the Board of Park Commissioners of the City of New York in December. Finally, on June 24, 1909, it was approved by the Board of Estimate and Apportionment, and a contract was entered into between the City and the Institute on December 28, 1909, thus completing the necessary legal steps for the establishment of the Garden.

Of the many men who sponsored the movement for the establishment of a botanic garden in Brooklyn, chief credit must be given to Professor Franklin W. Hooper and Mr. Alfred T. White. The conception of a botanic garden was due to Professor Hooper, and it was as the result of his energy and enthusiasm, supported by the government and influential citizens of the City, that legislation was obtained, setting these lands apart for use as a botanic garden. The idea of having the Garden administered by the Trustees of the Brooklyn Institute of Arts and Sciences was Mr. White's, and it was he who secured the initial endowment of $50,000, required by the City as a condition of entering into a coöperative arrangement with the Institute for its establishment.

*Lowell M. Palmer, Eugene G. Blackford, Col. Robert B. Woodward, Julian D. Fairchild, and Horace J. Morse.

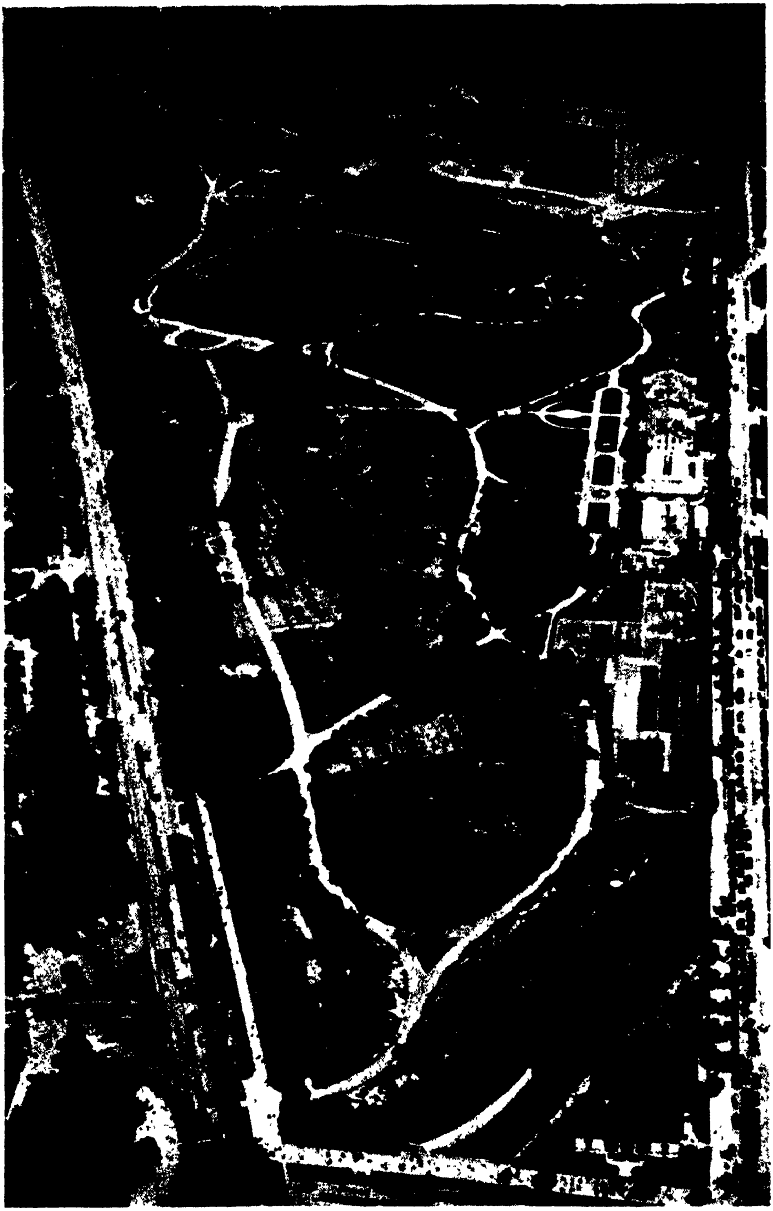


FIG. 2. Airplane view of Brooklyn Botanic Garden, May 30, 1940. (Photo by Fairchild Aerial Surveys, Inc.) (10058)

## THE DIRECTOR

The success of the venture in founding the Garden depended greatly upon the wise selection of the Director, and the members of the Board of Trustees showed remarkable foresight in their choice of Dr. Charles Stuart Gager, at the time Professor of Botany in the University of Missouri. His educational and scientific training, and his experience in teaching and research, eminently fitted him for undertaking the development of the Botanic Garden.

Following his graduation from Syracuse University, where he received the bachelor's degree in 1895, Dr. Gager acquired, during the next fifteen years, a wealth of varied experiences in botanical teaching and research. The years 1895-1904 were spent in teaching and advanced studies, with emphasis on botany. During 1895-1896 he was Vice Principal of the Ives Seminary, Antwerp, N. Y. The next year, 1896-1897, he was a student at the New York State Normal College, Albany, N. Y., where he obtained the two degrees, Bachelor and Master of Pedagogy. In the fall of 1897 he became Professor of Biological Sciences and Physiography at that institution, holding the position until September, 1904. He attended the Harvard Summer School in 1898, and was at Cornell University during 1901-1902, for graduate study and as Assistant in Botany. He obtained his degree of Doctor of Philosophy in June, 1902, from Cornell, carrying on his research under the direction of Professor George F. Atkinson. He returned to Cornell as Instructor in Botany during the summer of 1904.

The years 1904-1910 were spent in research and the teaching of botany in several institutions. He was Laboratory Assistant at the New York Botanical Garden under Dr. Daniel Trembly MacDougal during 1904-1905. In the spring of 1905 he was Acting Professor of Botany at Rutgers College, N. J., and in the fall of 1905 he was teacher of botany at the Morris High School, New York. He also taught botany at the summer sessions of New York University in 1905 and 1906. In February, 1906, he succeeded Dr. MacDougal as Director of the Laboratories at the New York Botanical Garden, holding this position until August, 1908, where he devoted himself largely to research, making a

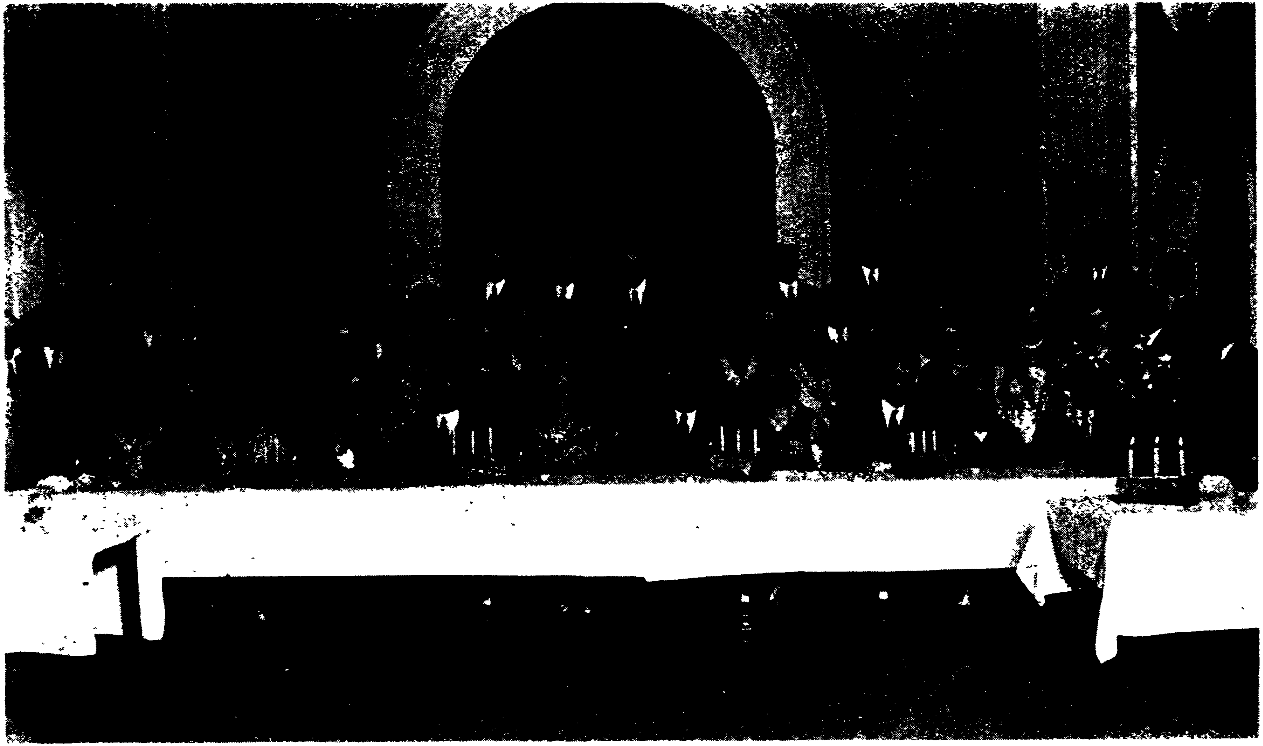


FIG. 3. Organization dinner, April, 1930. (7700)

special study of the effects of radium on plants, the results of his investigations being published in 1908 as *Memoir* 4 of the New York Botanical Garden. His interest in this subject continued throughout his life.

In September, 1908, Dr. Gager was appointed Professor of Botany at the University of Missouri. He was in charge of the general course in botany and also taught advanced courses in physiology and morphology. The general course had a large enrollment, mostly freshmen or sophomores in the College of Agriculture or the College of Arts and Science, and offered him an opportunity to round out his varied experience in botanical teaching.

Thus, when the Director assumed his duties on July 1, 1910, he brought with him a rich background of interest and experience in the field of botany, particularly with regard to botanical education. He was well acquainted with varied types of institutions—normal schools, high schools, research laboratories, and private and state universities.

Such were the resources of the man, not yet thirty-eight years of age, who was appointed to direct the great undertaking of building a botanic garden in Brooklyn. These resources would have been of little value for this particular work had they not been coupled with Dr. Gager's broad vision and purposeful plans. From the very beginning he was determined to build not merely a local botanic garden, but an institution which would be entitled to take a prominent place among the botanic gardens of the world.

How great was his vision may best be understood by recalling what he saw on that July day when he first surveyed the land which had been assigned to botanic garden purposes. Standing on the southeast corner of the Prospect Hill Reservoir, now Mount Prospect Park Playground, he could overlook practically all the land that later became incorporated into the grounds. A few years before, the Park Department had made some improvements, throwing up a border mound along Flatbush and Washington Avenues. A few trees were planted, and walks extended through the area. Towards the east was an uninviting-looking pond and, in the distance toward Malbone Street, now Empire

FIG. 4. Laboratory Plaza with Magnolias in bloom. Daffodils on Boulder Hill, April 17, 1937. (9425)

Boulevard, the area was used as a dump ground by the Park Department where, almost daily, bonfires of rubbish were burning.

The question of how best to utilize this not too attractive expanse of unimproved park land was, of course, uppermost in his mind. As he viewed the situation and drew upon his background and experience, he envisaged plantations containing trees, shrubs, and herbs of botanical interest, and groupings of horticultural varieties illustrating the progress in their development, as well as their utilization in beautifying the grounds. Interwoven with these plans was the idea of popular education in the field of botany and horticulture for the people of Brooklyn, and the need for contributions in botanical research fitting to an institution such as he wished to create.

Most fortunate was the young Director of the Garden to have associated with him Mr. Alfred T. White, Chairman of the Botanic Garden Committee. On the one hand, the technical knowledge, training and experience in botanical science of the younger man, on the other, the generosity, interest, and kindly understanding of the older man, combined with the vision, enthusiasm, and ability of both, laid a perfect foundation for the harmonious building of an Institution—"All that we have done at the Brooklyn Botanic Garden either could not have been done at all, or could not have been done so promptly and efficiently save, not only for the material contributions, but for the time and thought and sympathy which Mr. White put into it." Such was the tribute of Dr. Gager to Mr. White after the latter's death in 1921.

Today that same land, with an additional eleven acres, presents a sharply contrasting picture—the fulfillment of the Director's vision—a Botanic Garden of great beauty which contributes to botanical science the world over through research and which offers, from the plantings, library, and herbaria, educational, recreational, and cultural opportunities to the people living in or near Greater New York.

In his first Annual Report, Dr. Gager presented a list of types of plantations which might be established. These included sections on the systematic arrangement of plants, a local flora (herbaceous and woody plants growing within a radius of one hundred miles of New York City); plantings illustrating the variations in

Fig. 5. Local Flora Section view facing northwest, showing pool and sand area, September 28, 1933. (8508)

morphology, and ecological requirements of plants, and areas devoted to economic and horticultural features. He also presented an outline of organization by departments, including staff members for administration, research, instruction, and other activities. As the years passed by and funds became available, many of his ideas were translated into actualities. With the gradual development of the Garden, changes in view-point occurred, and while some of his plans await the future, many of them were carried to fulfillment during his administration.

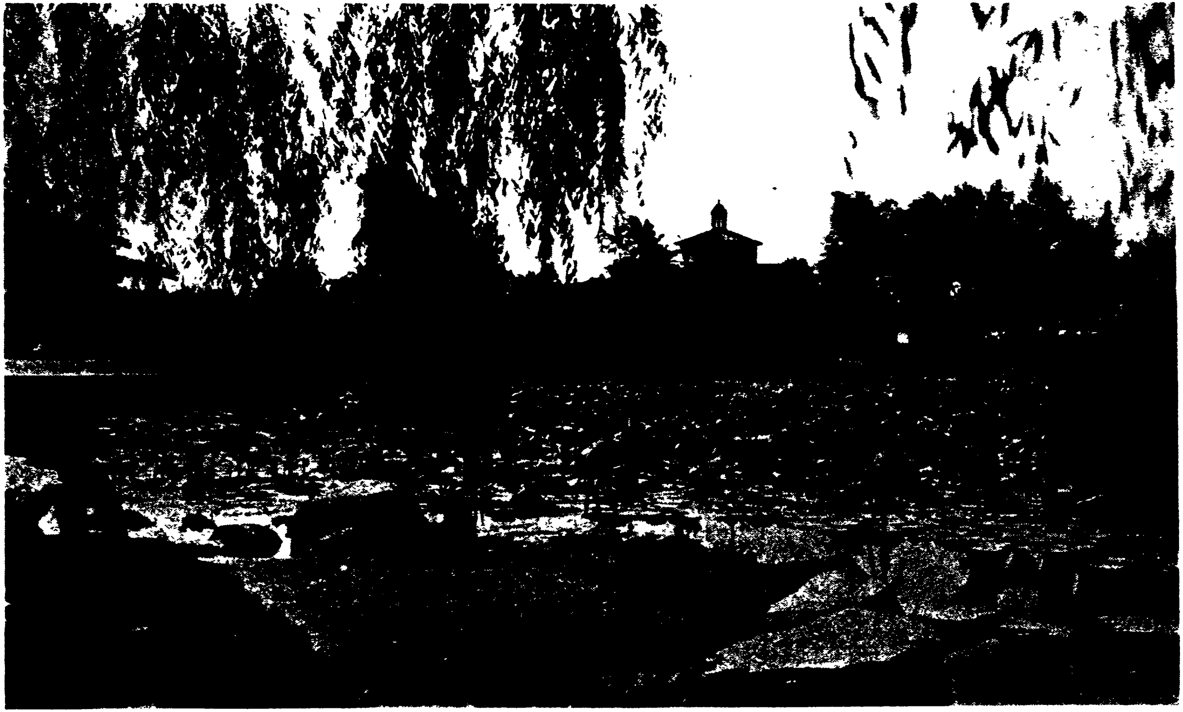


FIG. 6. Scene in the Japanese Garden. Stone lantern and drum bridge at the left. Storks and East Indian Lotus (*Nelumbo*) in the Lake. Torii at the right. Laboratory Building in the middle distance. July 24, 1925 (5620)

## THE PLANTATIONS

The proper development of the land set aside for Garden purposes presented many difficulties, since there were few natural features upon which to base any definite plans.

As the first step, a topographic survey of the area was prepared by D. Barta & Company, previous to July 1, 1910. During the fall of 1910, the firm of Olmsted Brothers, of Brookline, Mass., was appointed landscape architects to lay out the grounds. The plan submitted by this firm was adopted in its broader outlines by both the Institute and the Commissioner of Parks of the Borough of Brooklyn.

Obviously, for the development of the Garden, it was necessary to provide for a staff of workers. Since the development of the plantations was the primary problem, the first Curatorship established was that of Curator of Plants. The duties were primarily concerned with the development and administration of the plantations, but included, also, the assembling and care of a herbarium.

The first Curator of Plants was Mr. Norman Taylor, appointed on March 16, 1911. In December, 1914, Dr. Alfred Gundersen became Herbarium Assistant and, somewhat later, Assistant Curator of the Herbarium. Finally, in 1924, he was appointed Curator of Plants, taking over the botanical phases of the Department.

From the first, horticultural activities constituted a large part of the work of the Department, but gradually became a much more prominent feature. Mr. Montague Free, in March, 1914, was appointed Head Gardener and in 1920 his title was changed to Horticulturist and Head Gardener and, later, to Horticulturist. Since January 1, 1927, the duties of administration and of developing the plantations from the horticultural standpoint have been carried on by him.

"A botanic garden needs the cooperation of the botanist and the landscape architect, for it should be not only a place where different kinds of plants are exhibited, but where they are exhibited effectively, and not only for their own sake (botanically), but as materials for decorative planting and landscaping, i. e. horticulturally." This quotation explains the idea which Dr. Gager had

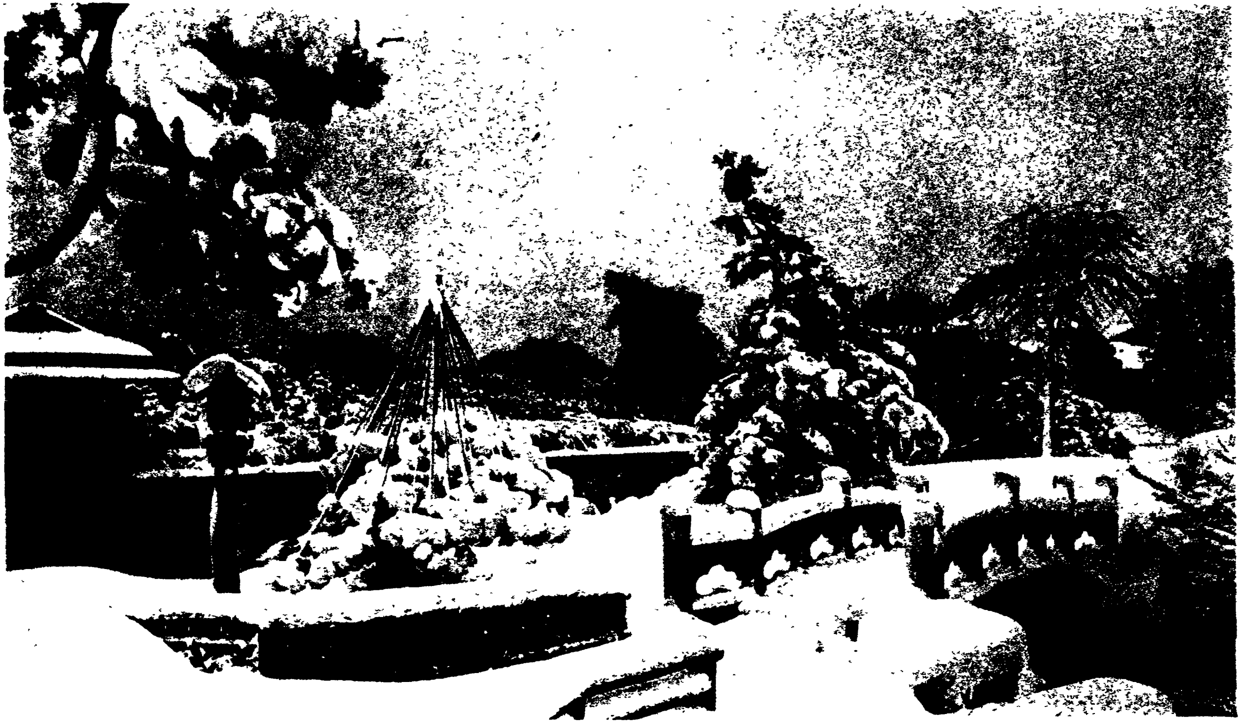


FIG. 7. Winter scene in the Japanese Garden, January 4, 1923. (4408)

in mind when he planned to have the Brooklyn Botanic Garden beautifully landscaped, as well as planted to botanical specimens. In order to carry out the general basic landscape plan of the Garden as developed by Olmsted Brothers, Mr. Harold A. Caparn was appointed Consulting Landscape Architect, January 1, 1912. As the result of his supervision through the years, the perfection of carefully planned vistas, the symmetry of formal design, the subtle balance of informal plantings, and the effective use of plant material, can not escape even the most unobserving visitor at the Botanic Garden.

By enlisting "the aid of horticulture and landscape architecture to arouse and foster a wider botanical interest in plants," many persons must have added to their botanical knowledge because their interest was aroused by the beauty of the design. In this way, the Brooklyn Garden has become "the common meeting ground of horticulture and of botany," where the garden does not exist solely for the plants, nor the plants for the garden, but where the function of being "educational and otherwise serviceable from the standpoint of botany" is combined with that of beauty "as a garden."

During the early years, the grading and improvement of the soil was one of the chief problems. In this connection, one of the most interesting features was the construction of the brook. The original terminal moraine pond was enlarged to a lake and excavation, in some places to as much as seven feet, for the artificial brook was made at the same time the slope of the meadow was changed. Dams of glacial boulders were constructed, and the entire course of the brook designed to look as natural as possible. To prevent too much loss of water, the brook was lined with blue clay found when excavating for the Laboratory Building.

The water was first turned into the brook in May, 1912. This feature of the Garden was the particular joy of the Director, who was wont to refer to it as "my brook," since it was constructed upon his insistence, and against the advice and wishes of others. It has proven to be a most delightful addition to the Botanic Garden.

The primary scheme for the arrangement of the planting was developed along systematic lines. The scheme of classification fol-

FIG. 8. Glacial boulders placed along the Brook under construction, 1912.
(562)

lowed was based on the Engler and Prantl system. An unusual feature in carrying out the plan was the inclusion of trees and shrubs together with the herbaceous plants in the families to which they belonged. Further, in certain families, the highly specialized horticultural groups are usually planted in the same general area. Thus, the display of chrysanthemums is nearby the family of the composites.

At present, the Garden has a collection of more than 300 species of trees, representing about 100 genera. There is a total of 275 genera of shrubs, including about 1,000 species. There are also approximately 1,000 species of herbaceous plants. The horticultural varieties, however, of trees, shrubs, and herbaceous plants, greatly increase the total number of different kinds found growing in the Garden and add very great interest to the plantations.

In the course of the season there are many special displays of ornamental plants. In the early spring, the daffodils, naturalized on Boulder Hill and elsewhere, make a fine display. About the same time the magnolias in the Plaza in front of the Laboratory Building, and the forsythia in various parts of the Garden, are in bloom. Late in April or early May come the flowering cherries and the crab apples. Doubtless, the most noted feature of the Garden is the floral display along Cherry Walk. There, well-grown and mature trees of the variety Kwanzan attract thousands of visitors for a week to ten days. Nearby are other varieties. Not far away are numerous crab apples, which add to the beauty of the scene. In the coming years, a new planting of seventy-six trees of the same variety, made in 1941, should make an attractive display.

Then follow, in succession, the blooming periods of the lilacs and wisterias, the azaleas, peonies and iris, spireas and viburnums. In late May come the roses. In the summer, the most attractive displays are the waterlilies in the pools in front of the Conservatories. There are fine collections of both hardy and tropical varieties and, in the adjacent border, are plantings of many varieties of annuals. It may be mentioned that the water-lily pools were the last gift of Mr. Alfred T. White to the Garden.

In late July and August, in the Garden lake, the East Indian lotus, with its huge flowers, makes a unique display. This plant-

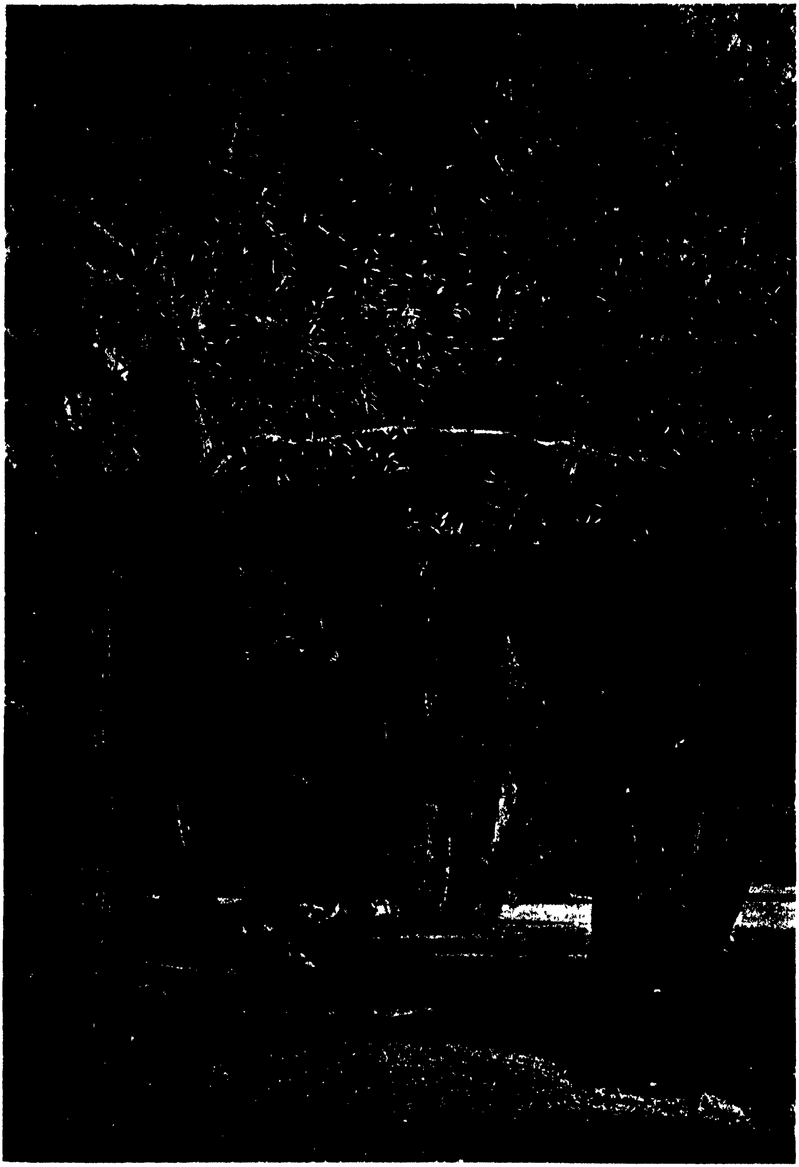


Fig. 9. Willows along the Brook. Planted October, 1912. September 4, 1940. (10111)

ing of lotus, reminiscent of oriental art and sacred religious associations, and seldom found in this part of the country, is a close second to the flowering cherries as an attraction.

In the fall, we look forward to the American asters and the display of chrysanthemums, which wind up the season. Among the other attractive features of the fall are the fruits of the crab apples, the rose hips, and the berries on the beauty bush and other shrubs. An exceptionally beautiful display in the late fall is the brilliant coloration of the leaves of *Euonymus alatus compactus,* which forms a unique hedge on the Plaza in front of the building.

Many special features have been developed, and Dr. Gager quickly adopted the term, suggested by a friend of the Garden, of "Gardens within a Garden" as a very apt description. One of the earliest special developments among the plantations was the Native Wild Flower Garden, or Local Flora Section. Because of Dr. Gager's special interest in the plants growing within a hundred mile radius of New York, a section devoted to the local flora was begun in the spring of 1911. A valley 600 feet long, covering about two acres, was chosen as the site, and numerous beds for native plants not requiring special habitats were prepared, woodland conditions being provided for others.

In 1931, reconstruction of the Local Flora Section was begun on an ecological basis and it was divided into sections, each providing the very different conditions for growth which are found in the area surrounding New York City. The area was carefully landscaped to present the characteristic plants in settings which are, on a small scale, as nearly like their original natural surroundings as possible.

Conditions of full sunlight and deep woodland shade, dry sandy soil and moist rich forest humus, pond, bog, and wet meadows, limestone, serpentine and granite rock, are all found in this relatively small garden, each supporting the growth of characteristic native plants. These conditions not only provide differences in moisture, light and plant foods, but also reflect the geological areas found near New York—the sandy coastal plain, crystalline, limestone, and serpentine rock outcroppings, and mountain areas, from which the plants have been collected.

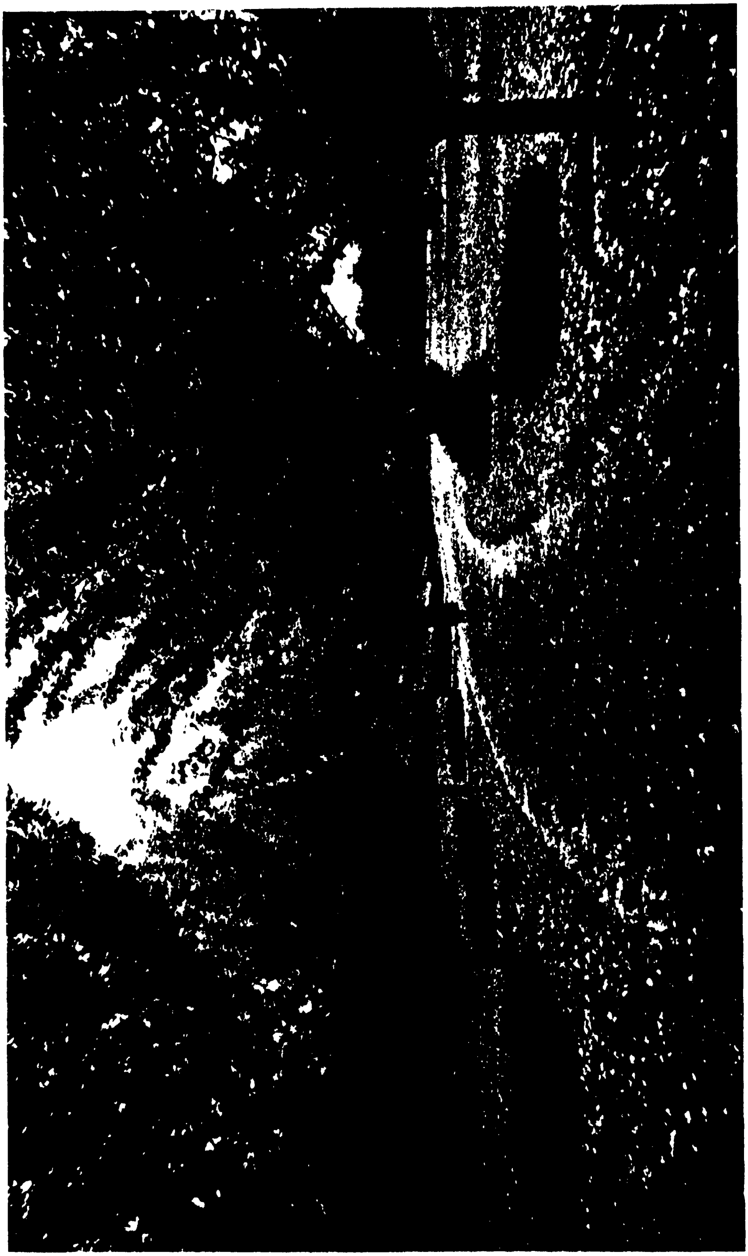


Fig. 10. Cherry Walk. View south from the north end. Fallen flowers on the ground. May 13, 1932. (8032)

The majority of the wild flowers bloom in May, but from late March or early April, when the hepaticas are the first to blossom, until fall, when the golden-rods and asters show their colorful blooms, there is something of interest to be seen in the Local Flora Section.

The next special garden to be developed was the Japanese Garden, covering about an acre, a gift of Mr. Alfred T. White in 1914. It is an oriental garden in the true sense, having been designed by a Japanese architect, Mr. Takeo Shiota, and, since 1919, has been under the care of Miss Mary Averill, Honorary Curator of Japanese Gardening and Floral Art, who spent many years in Japan devoting herself to the study of these subjects. It is a garden embodying the oriental idea of a place for contemplation, not for activity. Its beauty is maintained throughout the year by the use of rocks, which form a deep gorge in the hill bounding one side of the garden, by cascades of water flowing over these rocks into the lake, and by the use of artistically placed evergreens, the latter meticulously pruned to keep them in scale. The significance of the design of the Japanese Garden, which illustrates certain oriental ideas, and of the architectural features, may be obtained from the *Guide* written by an oriental for occidental visitors to the garden.

The beauty of the flowering cherry by the tea house and the wisteria blossoms gracefully drooping over the rocks near the waterfall are especially appreciated in the Japanese Garden because the blossoms are in contrast to the evergreens which make the background. The restrained use of single clumps of Japanese iris near the water's edge is equally enchanting. Even to those who make no attempt to understand its significance, the quiet charm of this bit of oriental landscape offers a welcome retreat from the city's tempo and noise.

In 1917, the Rock Garden was opened to the public. It contains many interesting alpine and saxatile plants. There, on a boulder-strewn slope, several hundred species of these plants, which require very specialized conditions for growth, are displayed. There is no month in the year when something of interest may not be found, but the most colorful masses of blossoms appear in May. The rocks which provide the background for this ecological exhibit

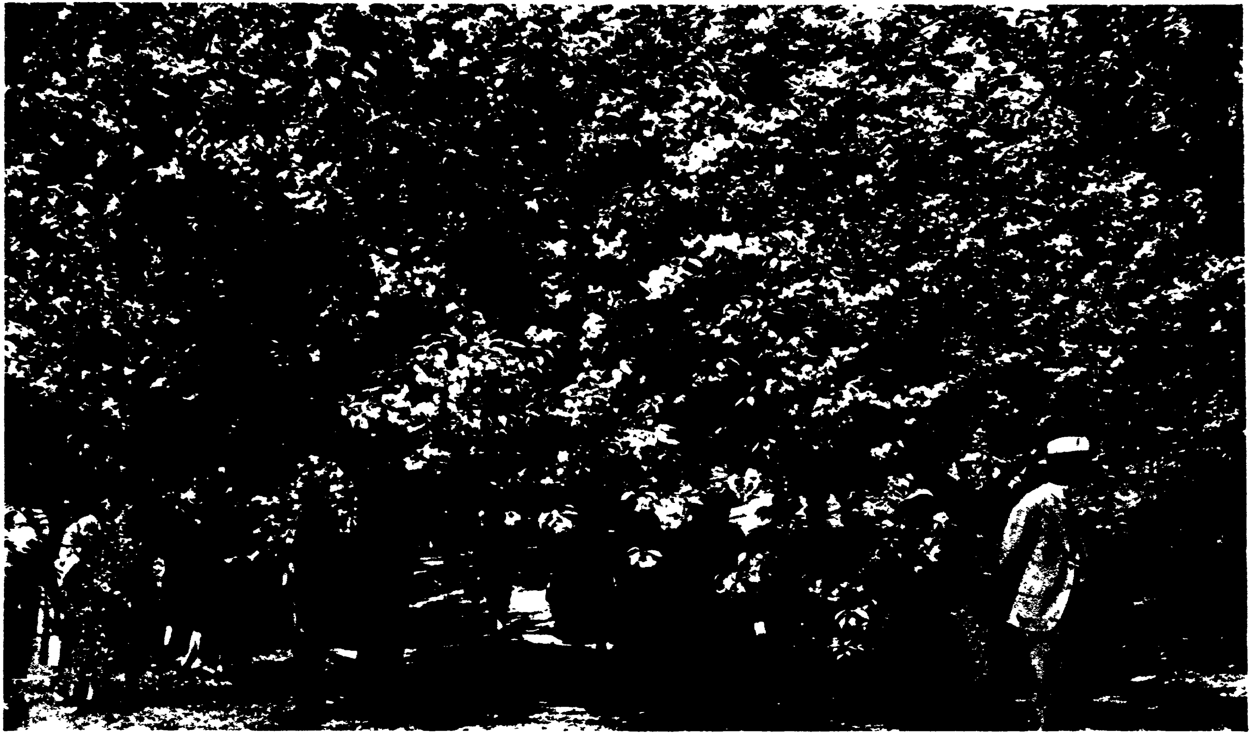


Fig. 11. Cherry Walk, May 9, 1939. Facing north. (9827)

are glacial boulders deposited during the Ice Age by one of the continental ice sheets which terminated on Long Island, and which were dug up during grading operations on the Botanic Garden grounds. They make up in authenticity and geological interest for what they may lack in value for plant culture. They vary in size from small cobblestones to boulders six feet or more in greatest dimension. Their story has been told in a Garden *Guide* and twenty-eight of them have been labeled with bronze tablets, provided by Mr. Edward C. Blum, Chairman of the Board of Trustees of the Institute, which give their composition and history. Some of the boulders came from nearby points, but one traveled with the glacial ice from the southeastern Adirondack Mountains, about two hundred and fifty miles.

Probably there is no association of season and flowers so universal as that of June and roses. Because of this fact, the opening of the Rose Garden in June, 1928, occupying an area of about an acre in the Botanic Garden, must have been as greatly appreciated by the general public as it was by rosarians. With his usual vision, Dr. Gager felt that since a rose garden would be of great beauty and educational value as a part of the Botanic Garden, it might be wise to publish in his annual report of the year 1926 a sketch of the proposed rose garden as designed by the consulting landscape architect. By unusual good fortune, the design and idea appealed to Mr. Walter V. Cranford, who happened to see the annual report, and shortly thereafter he and Mrs. Cranford gave the Garden a sum of $10,000, later increased to $15,000, to realize these plans.

Work on the garden began in June, 1927. Every effort was made to plan carefully, so that a minimum of grading and moving of soil was required. It was disconcerting, however, to find two old roads just under the surface soil, which added to the difficulties of making the soil fit for rose culture. Many roses were generously donated by nurserymen and rose growers, and by the following spring the garden was well planted. In 1936, the Rose Arc, an extension of the Rose Garden, was given by Mrs. Cranford as a memorial to her husband. The roses in the arc are planted around a central pool.

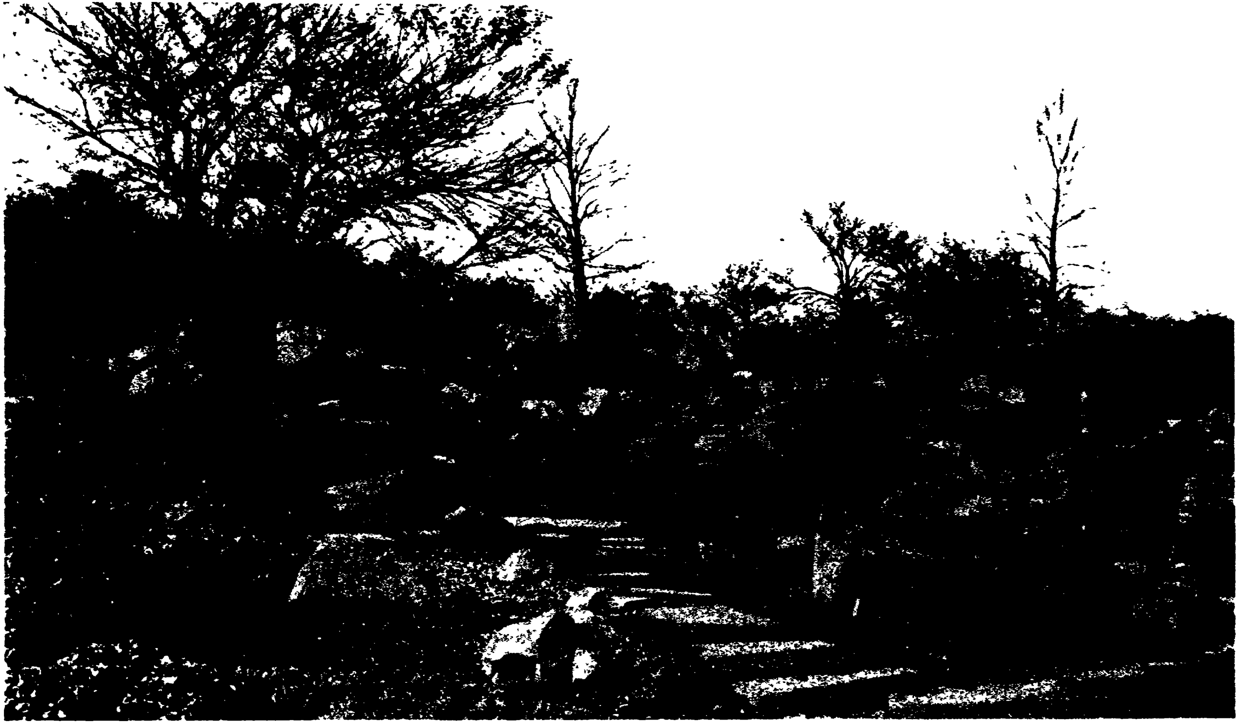


FIG. 12. Rock Garden, facing northwest, October 26, 1917. (2585)

Since the Rose Garden was planned not only to be a place of beauty, but also an educational feature, an attempt has been made to grow practically every type of rose that is hardy in this climate, and to display the types in many different ways. Roses grow wild in the Northern Hemisphere and, because cultivated varieties are derived from these wild species, it was considered of educational value to frame the rose garden with a wide border of wild roses. There was no sacrifice of beauty in this procedure, since many of the wild forms are of horticultural value because of their abundance of blossoms, such as are produced by *Rosa setigera*, the prairie rose; their interesting foliage, such as the wrinkled leaves of the *R. rugosa;* or their attractive fruit, produced by forms like *R. virginiana*, *R. rugosa*, and other species.

The central panel of fifteen beds of roses from the groups Noisette, Bourbon, China, tea, hybrid tea, polyantha, and hybrid perpetual, the last three groups preponderating, offers a wealth of information to persons who wish to learn about roses. The mass of blossoms on the climbing roses, so well displayed on enclosing fences, pergolas, pavilion and pillars, impresses one upon entering the Rose Garden during the season of their bloom. There are nearly twenty groups of climbing roses in the garden, totaling about eighty varieties. Their flowers are single or double, and occur either singly or in clusters.

Visitors who enjoy flowers of particular historical interest may observe a unique group of roses in one of the beds. The group includes a species mentioned by Pliny in his *Natural History*, the cabbage rose, which has been grown in Europe for two thousand years, and the damask rose, which is the source of "attar of roses."

The most recent additions to the "Gardens within a Garden" are the Herb Garden, and the Medicinal Plant Garden, which contain about fifty culinary and nearly one hundred medicinal plants, attractively arranged around two central symmetrical patterns of "knots." The knot designs are adaptations from early sixteenth century gardens, when growing herbs was a popular pastime and their design an important feature. The beauty of these knots, where foliage color and texture are carefully combined to afford interest, may best be enjoyed from the Overlook above the garden. Today, because of their intrinsic value as interesting

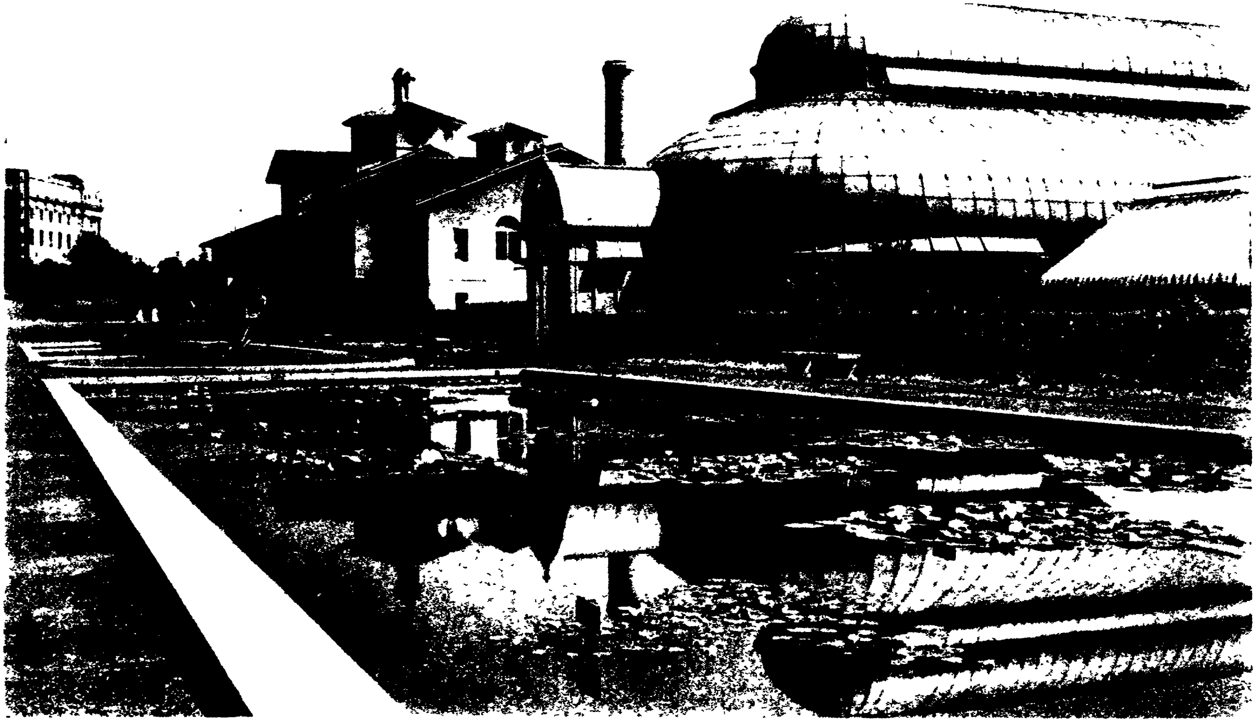


FIG. 13. Conservatory Garden. Hardy waterlilies in the near pool: tropical forms in the distant pool, July 10, 1922. (4186)

garden plants, and with importations of herbs limited at a time when foods require more careful seasoning, there has been a great revival in interest in herb gardens. Miss Elizabeth Remsen Van Brunt is Honorary Curator of Culinary Herbs.

The Medicinal Plant Garden is a realization of plans made when the Garden was founded to include such plants. Their importance in modern medicine is still great in spite of encroachment by synthetic chemicals, and their display is of interest not only to the nurses who have formal class instruction at the Garden regarding their appearance and use, but to all who seek to increase their botanical knowledge.

In a secluded spot among the pines on the shore of the lake may be found the beautiful bronze tablet, designed by Daniel Chester French, and presented to the Garden in 1923 by a committee of citizens as a memorial in recognition of Mr. White's outstanding public services, of which the Botanic Garden was only one example.

One of the most formal plantations of the Garden is the recently established Horticultural Section, in which is featured the Dean Clay Osborne Memorial, which was presented in 1939 by Mrs. Sade Elisabeth Osborne in memory of her husband. The memorial includes a fountain, water basin, seats and columns designed by the Garden's consulting architect, Mr. Harold A. Caparn, and placed in a setting of trees and shrubs of the more common horticultural varieties. Carved in the base of the Indiana limestone columns is a design of unusual beauty of ginkgo leaves and seeds.

The arbors of this section of the Garden, on which vines are trained, afford a good example of Dr. Gager's statement that at the Brooklyn Botanic Garden "an endeavor is made not only to exhibit plants as botanical specimens, but also to show how . . . the plants . . . may be used in decorative planting." In the spring, the Wall Garden, with its colorful rock plants, which marks one boundary of the horticultural plantation, is a feature.

Adding to the interest of the trees at the Garden are those which have been planted by outstanding botanists or friends of the Garden. The first trees to be so honored were a sweet-gum planted by the famous botanist Hugo deVries, September 12, 1912, and a tulip tree planted October 16, 1913, by Adolf Engler, world-renowned systematic botanist, while on visits to the Garden. At the Second Annual Spring Inspection of the Garden, on May 9, 1916, a white oak was planted by Mr. Alfred T. White, the Garden's greatest benefactor. On the same date, a pin oak was planted by Miss Frances E. White, and a red oak by Miss Harriet H. White, sisters of Mr. White, and both generous contributors to the Botanic Garden. On the same occasion, a black oak was planted by Mr. A. Augustus Healy, President of the Board of Trustees when the Garden was established and one of its chief benefactors. Since then, several other trees have been planted, or endowed, by individuals and organizations.

Throughout the winter, the Garden's conservatories attract many visitors and students. Several sections are given over to exhibits of cacti native to the deserts of the United States and succulent plants of Africa, to collections of orchids, cycads, and varieties of Boston fern. Always of interest is the Economic House, in which are displayed tropical plants of utilitarian value, such as banana, coffee, and rubber, and which is extensively used by visiting school classes.

The group of Australian cycads housed in the conservatories has an interesting story. In 1914, Dr. Gager arranged through the Curator of the Botanic Garden, Rockhampton, Queensland, Australia, for an expedition to collect these plants for the Brooklyn Garden. They were collected, packed in large cases, and shipped. Due to war conditions, they were landed and transferred at Sydney, Port Said, and London, as in each port their ship was taken over for carrying troops. After seven months of travel they arrived at the Garden and, because of excellent packing and their natural resistance to drought, they were still alive and, by excellent care, were established in the conservatories. Such may be the romance of collecting plants.

## THE LABORATORY BUILDING

The center of the Garden activities and of their administration is the Laboratory Building. The original floor plans of the building were made by Dr. Gager before he left the University of Missouri. He spent many hours in working out preliminary arrangements for laboratories, classrooms, and offices. These were submitted to the architects, McKim, Mead & White, who designed the building in 1910.

Careful attention was paid to determining the architectural style of the building because of its relation to the Brooklyn Museum Building which was arranged, when completed, to open onto the Botanic Garden grounds. The Laboratory Building, with the greenhouses, then, had to be fitted in with this general plan. Consequently, it was located on Washington Avenue and a style of architecture was selected which provided for a low type of building. Modified Italian Renaissance design was chosen, and the plan of a Greek cross with a cupola at the juncture of the cross, a motif common to Lombardy chapels, was employed. As viewed from various points in the Garden, it is a very attractive structure.

Dr. Gager worked out a scheme for the treatment of the exterior of the Laboratory Building to include the placing of names of former botanists of note on the frieze and on panels under the windows. The selection of these names was the result of a vote of prominent American botanists.

For the chief place of honor, namely, the frieze, the names of twenty-two botanists were selected, Linnaeus and Darwin occupying the principal positions on each side of the main entrance. The names of forty-seven botanists were placed in the panels under the windows, and included five American botanists. A vacancy under one window was left until 1937, when the name of deVries, who had recently died, was carved.

The building houses the administrative offices, auditorium, laboratories, rooms for research, the herbaria, library, and class rooms for the work of instruction.

The first section of the building was completed and occupied September 24-26, 1913, and officially opened on December 13,

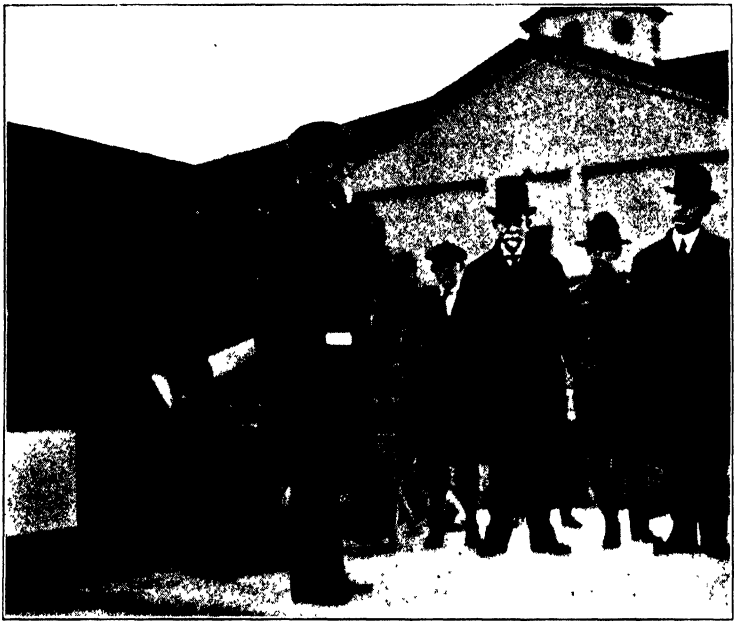


FIG. 14. Laying the corner stone of the Laboratory Building, April 20, 1916. Left: Alfred T. White. Center: A. Augustus Healy. Right: C. Stuart Gager. (2036)

1913. The corner stone of the main part of the building was laid April 20, 1916, by Mr. Alfred T. White, whose contribution of $100,000 to match an equal appropriation by the City made possible the completion of the second section of the building. The building was finished and the Dedication Ceremony was held April 19-21, 1917. At this first official gathering, members of the Board of Trustees of the Institute, municipal officers, and scientists, were present. Dedicatory addresses were made by Mr. A. Augustus Healy, Prof. John Merle Coulter, Hon. William A. Pendergast, Hon. Lewis H. Pounds, Hon. Raymond V. Ingersoll, and Dr. Gager. The large attendance by scientists was a compliment to the scientific standing of the new Director, and the three-day program of scientific papers made the occasion a memorable one.

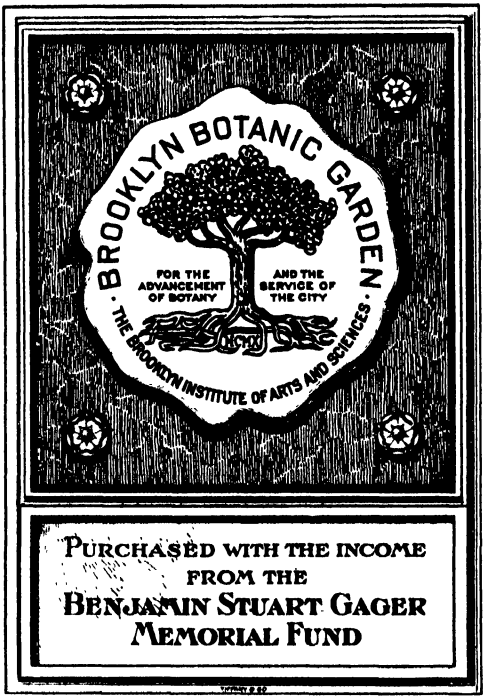

BROOKLYN BOTANIC GARDEN
FOR THE ADVANCEMENT OF BOTANY
AND THE SERVICE OF THE CITY
MCMX
THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES
PURCHASED WITH THE INCOME FROM THE
BENJAMIN STUART GAGER MEMORIAL FUND

FIG. 15. Special book plate of the library.

## THE LIBRARY

VERUS BOTANICUS UBIQUE SCIENTIAM BOTANICES EXCOLIT OCULIS PROPRIIS QUAE SINGULARIA SUNT OBSERVAT NEC SUA SOLUM EX AUCTORIBUS COMPILAT. Linnaeus MDCCL.*

Many, on entering the library for the first time, pause to read the above inscription which, in essence, is the dictum of Agassiz, "Study nature, not books." Nature to Dr. Gager, however, was not in itself sufficient; books also were needed. Endless would be the task and hard the way of him who, in this day, would attempt to wrest a secret from plants without first searching out what had already been done in his field of endeavor. Here in the library is gathered together the accumulated and recorded knowledge of botanical workers of the past. The present collection of books and journals is a tribute to the skill with which Dr. Gager accomplished his object of assembling a well rounded botanical library, rich in early fundamental works, monographs, books, and complete sets of highly technical botanical periodicals.

The Librarian's function was at first combined with that of Secretary by Miss Bertha M. Eves. In September, 1913, the library growth necessitating full time attention, Miss Helen Virginia Stelle was appointed Librarian, followed by Miss Anna K. Fossler (Acting Librarian), Dr. Laura E. W. Benedict, Miss Ray Simpson, Mr. Calvin W. Foss, Mrs. Emilie Perpall Chichester (Acting Librarian), and Mr. William E. Jordan.

During 1911, the first year of the library's existence, subscriptions were purchased for four periodicals, and as early as October, 1912, Dr. Gager wrote of the needs of the library, and listed ten of the periodicals most urgently desired. He suggested that donors, interested in the library, might by endowment secure for it a given periodical in perpetuity.

During 1915, special stress was laid on enriching the files of current periodicals, and by the end of the year 224 titles were being received. Since the Botanic Garden issues several valuable

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* Dr. Gager made the following free translation of this quotation: "The true botanist everywhere cultivates the science of botany. With his own eyes he observes those things that are noteworthy, and he does not merely compile his own works from authors."

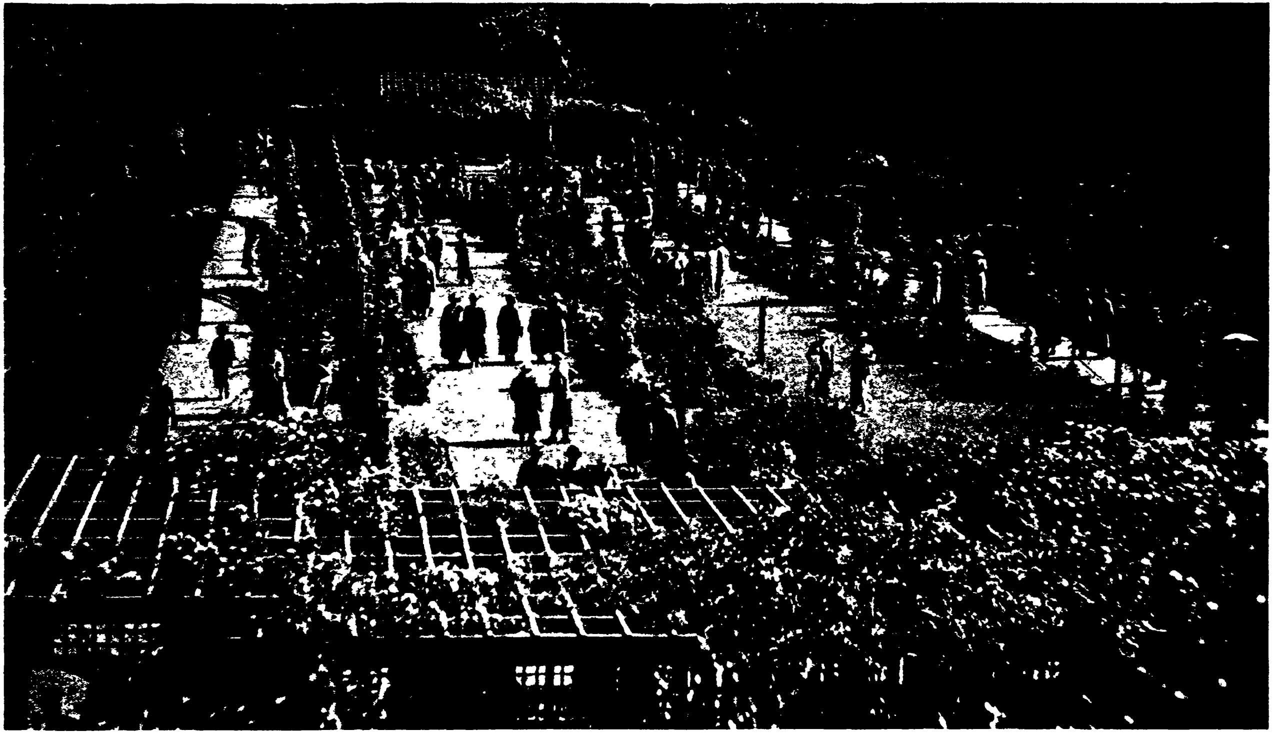

FIG. 16. The Rose Garden on Rose Garden Day, June 9, 1936. (9322)

publications of its own, an arrangement of mutual benefit was made with other institutions to exchange periodicals. As a result of exchanges, gifts, and subscriptions, the periodical and serial list doubled in the five years through 1920, increasing steadily to 1937, when it reached a peak of over 1000 titles received currently. General economic conditions and the world war have enforced a temporary decrease to about 700 in 1943. In June, 1929, the librarian stated that: "In these thirteen years the aim of the director and the librarian has been to complete the files of periodicals, serials and society transactions. The library today is rich in these completed sets. . . ."

The value of current periodicals to the staff or to any reader engaged in a botanical research problem cannot be overestimated. It is in these current publications that the most recent discoveries, the complete observations and detailed results of experiments are to be found. Dr. Gager's foresight in urging the addition of such a large number of them to the Botanic Garden library will be of lasting benefit to all who make use of the institution's resources.

The working collection of this, as of any library, is composed of the separately classified books. The story of the acquisition of this collection is, as with the periodicals, the story of the building of something of value out of nothing except an idea, a need, and the aid of interested friends. On January 1, 1911, when the first Librarian took up her duties at the Brooklyn Botanic Garden, she found herself at the head of a library which did not possess a single book, and which was temporarily housed in the Central Museum Building. If the library was, as the agreement between the City of New York and the Brooklyn Institute of Arts and Sciences stated, "to be administered as a public, non-circulating library open without charge to all properly qualified citizens," the first and obvious need was for books. The lack of books was immediately remedied by Dr. Gager's gift on that day of nine books, which formed the foundation for the present library. During 1911, over 250 books and several hundred pamphlets were received as gifts or by purchase. The purchases were limited mainly to the immediate needs of the staff for reference in laying out and planning the grounds, because of lack of space at the time to accommodate the volumes. In November of that year, the Com-

FIG. 17. Rose Garden Day, June, 1931. (7237)

Left to right: Dr. C. Stuart Gager, Mrs. Walter V. Cranford, Mr. Walter V. Cranford, Miss Hilda Loines, Mr. Edward C. Blum, Mrs. Edward C. Blum, Dr. Jean Henri Nicolas, Mr. Harold A. Caparn, Mr. Montague Free

mittee on Botanic Garden of the Brooklyn Institute of Arts and Sciences decided that, as far as practicable, all books purchased for the Botanic Garden library and binding of books should be paid for by private funds, and so become the property of the Institute. Since income from the original $50,000 endowment fund of the Garden was to be used for buying plants as well as books, the Director requested a special book fund of $5,000 to $10,000. The most pressing immediate needs of the library were met with a $1,000 gift in 1912 from Mr. Alfred T. White.

During the period through 1915, the library, which had been moved in September, 1913, to a room in the first unit of the new Laboratory Building, acquired nearly 4,000 volumes. The library moved to its present quarters on completion of the Laboratory Building in 1917. There it grew to 6,500 volumes in 1920, nearly 16,000 in 1930, and over 22,000 in 1940.

The gifts of many friends aided materially in this growth. In 1913, the *Index Kewensis* was secured through the generosity of Mr. George D. Pratt. The gift of Mrs. Annie Morrill Smith of nearly 800 volumes added important works on Bryophytes. Other volumes were given by Mrs. Clarence R. Hyde, Mr. Leonard Barron, Mr. Frank H. Ames, and Mr. William J. Studwell. Dr. Gager was a steady and frequent donor of books. The gift by Miss Harriet White of Mary Vaux Walcott's *North American Wild Flowers*, and a gift by the Pierrepont family, should be mentioned.

The value of many of the works on the shelves is enhanced by the previous ownership and signatures of such men as de Candolle, Pasteur, Darwin, and Asa Gray. Dr. Gager was ever eager to add to the collection of such association items.

Several hundred pamphlets were received by the library during its first year, and by 1942 the pamphlet collection had increased to over 21,000.

Probably no gift to the Botanic Garden library was more appreciated by the Director than the $10,000 Benjamin Stuart Gager Memorial Endowment Fund, presented anonymously in 1918. Largely by means of a portion of the income from this fund, as well as by a few gifts, a priceless collection including incunabula, pre-Linnaean, Linnaean, and post-Linnaean books of scientific

FIG. 18. Rose Arc, facing west, June, 1938. (9750)

historical interest has been made. The gift, in 1911, by Mr. Alfred T. White, of a first edition (London, 1862) of Darwin's *Fertilization of Orchids,* which laid the foundation for a collection of rare books at the Botanic Garden, must have pleased the Director, whose keen interest in the collecting of historically valuable botanical books dated back to his youth. This collection became one of great pride and satisfaction to him.

Of special interest among these rarities are the incunabula, or fifteenth century books. Just before Columbus discovered America, the *Hortuli Commentarium* of Columella, Rome, 1485, and the *De Proprietibus Rerum* of Bartholomaeus Anglicus, 1491, were being printed. The latter was the standard work on natural history throughout the Middle Ages, and the Botanic Garden library is most fortunate in having these works, as well as six other incunabula, in its collection.

Included among the more than 500 pre-Linnaean works are many herbals, "those naïve, ponderous and cyclopedic works." * They contain descriptions and illustrations by the collectors of herbs, and are well represented by the rare *Adam in Eden* of William Cole, 1657, and *The Herball, or Generall Historie of Plantes, Gathered by John Gerarde of London, Master in Chirurgerie,* 1597, which contains probably the first published illustration of the Virginia potato. Mattioli's commentary on the *Materia Medica of Dioscorides,* which listed the medicinal properties of about six hundred plants and served as the basis for medical practice for over fifteen centuries, is represented in the library by many editions.

The pre-Linnaean group also contains interesting examples of works by botanists who pioneered in exact and discriminating observation, and in experimentation. Such is *The Anatomy of Vegetables Begun,* by Nehemiah Grew, 1672, which attempted to describe anatomical features of parts of plants, Robert Hooke's *Micrographia,* 1665, and Antony van Leeuwenhoek's *Opera Omnia,* 1695-1719, which introduced a new world of microscopic "animalcules!" and made possible the science of plant anatomy soon to be introduced by Grew, and Malpighi, whose *Anatome Plantarum,* 1675-79, forms a valuable contribution in this collec-

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* Bailey, L. H. *The Survival of the Unlike.* 4th ed. p. 139.

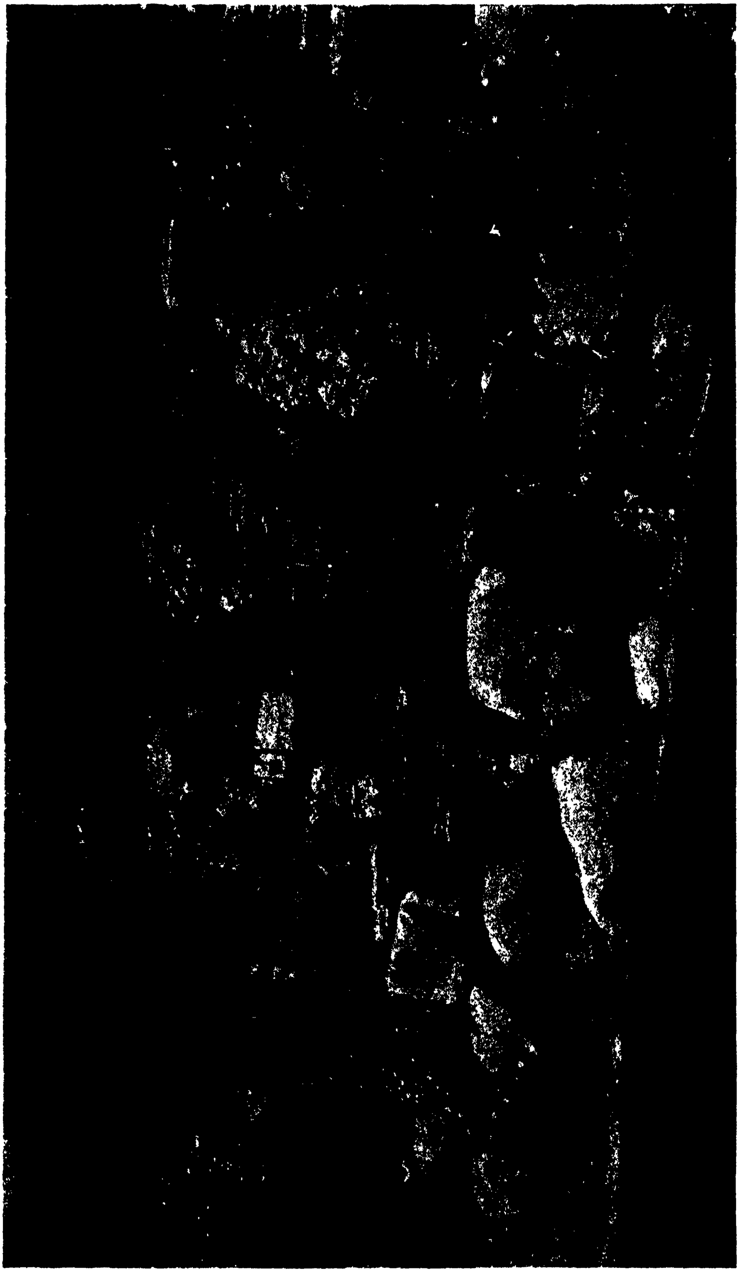

Fig. 19. Portion of Wall Garden, June 16, 1937. The entire length is about 385 feet. (9422)

tion. Simple, but most important, were the experiments by Francesco Redi which helped to disprove the theory of spontaneous generation, the 1671 edition of his *Experimenta Circa Generationem Insectorum* being in the library.

The valuable Linnaean Collection, works by Linnaeus, 1707-1778, or works based on his system of classification, contains several hundred volumes.

The post-Linnaean classics contain several "foundation" books: The first edition of a work by Spallanzani, 1785, which helped to establish the doctrine of biogenesis, Humboldt's *Essai sur la Géographie des Plantes,* 1805, which laid the foundation of plant geography, papers by Schleiden and by Schwann, 1839, on which was based the modern cell-theory, Hofmeister's work, 1851, on reproduction in lower plants, and Gregor Mendel's paper, 1866, describing his experiment on peas which founded the scientific study of heredity.

First editions of books by Charles Darwin comprise the Botanic Garden's collection of Darwiniana, including his *On The Origin of Species by Means of Natural Selection,* as well as all Darwin's works relating to plant life.

A gift of five hundred dollars was made by the Mrs. Field's Literary Club of Brooklyn, in 1939, for the purchase of rare books to constitute a memorial to Mrs. George White Field, the founder of the club. Purchases from this fund included works by Dillenius, 1741, Linnaeus, 1737, and Pasteur, 1862.

These rare volumes in the Botanic Garden library have great value, not only because they are collector's items but because they are original sources of information regarding the history and development of many phases of botany. It was a great pleasure to the Director to know that they were frequently consulted by students.

Two other collections reflect Dr. Gager's personal interest, one of autograph letters and the other of portraits of famous botanists, living and dead. The autographs include such well-known names as François André Michaux, Linnaeus, Robert Brown, Sir William Hooker, Thomas Huxley and John Torrey. A letter by Linnaeus, 1767, introducing a friend, and making a request for needed seeds, one by Charles Darwin, mentioning certain papers

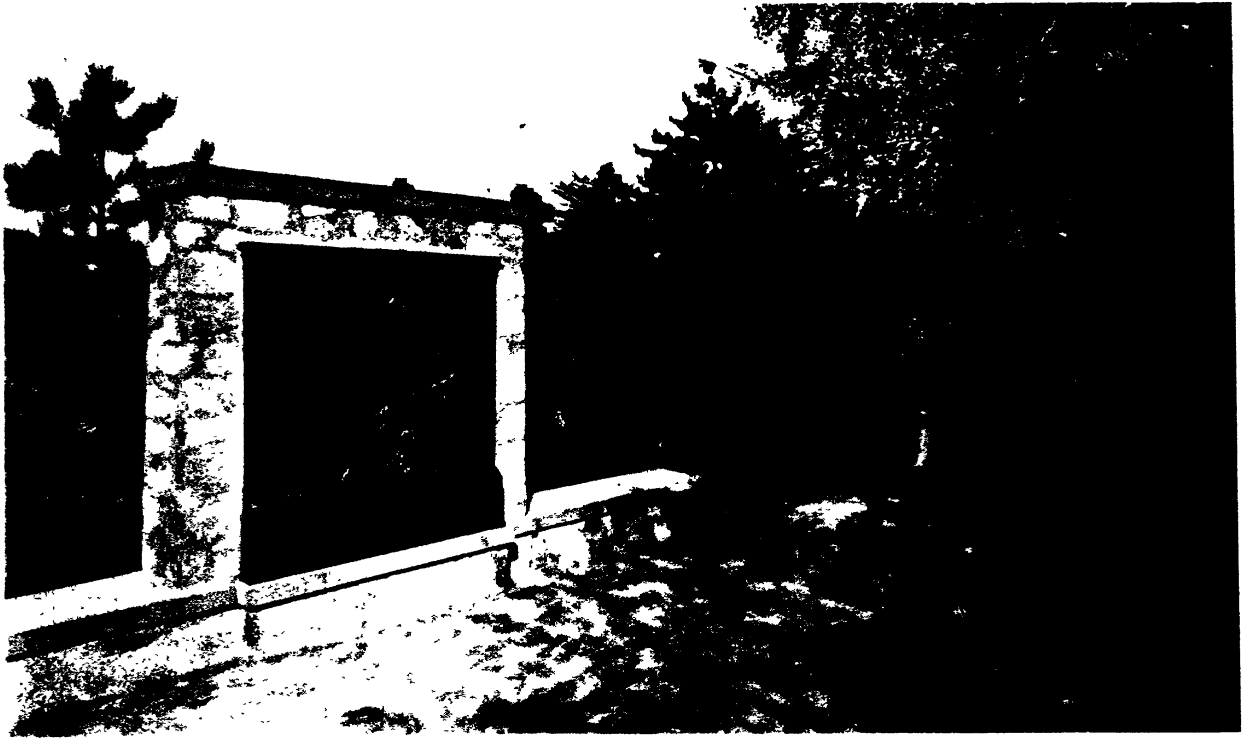

FIG. 20. Alfred T. White Memorial. Unveiled June 7, 1923. (5633)

soon to be published, and one by Robert Brown to Sir Charles Lyell, geologist, and presented to the Garden by Lord Lyell and Lady Longman, the previous owners, are treasures of this group. The portraits are not only interesting, but of value when illustrations for botanical publications are needed. The interest which Dr. Gager had in the history of botany was a stimulus to the further collection of these items.

The library has been enriched not only by the gifts and donations already mentioned but also by the George C. Brackett Fund, J. W. Frothingham Bequest, John D. Rockefeller, Jr. Fund, and the Martha Woodward Stutzer Memorial Fund, the income of which is set aside for the library.

Since the library is specialized, those who use it generally have special problems, and their number is thus small if compared with more general public libraries. However, for the year 1943 the total number of persons recorded as using the library was over 3,200. Recent accessions are prominently displayed for those who wish to browse for a few minutes, while complete indices to volumes, pamphlets, and periodicals are available for those who must delve into an obscure research problem. Help is willingly given to the staff, to individual readers, and often to nationally known business firms in finding the answer to specialized botanical questions. These questions may be for information regarding a problem in horticulture, for early drawings of medicinal herbs, for photographs of plant parts, or for the most recent methods of plant propagation. Most projects planned by any department of the Garden require a certain amount of library research for their execution.

To have available for use by interested persons a vast collection of botanical information is a service which is enhanced only by special exhibits of material on a particular subject, which are presented with the thought and care necessary to arouse interest in that subject. Such exhibits by the library are regular features of Spring Inspection days. For the Twenty-fifth Anniversary Celebration of the Garden in 1935, an outstanding exhibit of books and manuscripts illustrating the history of botany was assembled. Among other exhibits were those for the Long Island Tercentenary Celebration in 1936, the meeting of the American Rose Society and the Conference on Medicinal Herbs, both held at the Garden in 1939, and the 75th Anniversary Meeting of the Torrey Botanical Club in 1942, each containing books and letters of particular interest for the occasion.

Quite in keeping with Dr. Gager's interest in the scientific education of the children of the city, is the Children's Library, a collection of elementary books which is kept in an easily accessible location in the Boys' and Girls' Club Room. Many of the books have been given by the children themselves. Thus the Botanic Garden serves all ages, and offers a wealth of information on all phases of plant life, both theoretical and practical.

## THE HERBARIA

In addition to the collection of books and periodicals in the library, and of labeled plants on the grounds and in the conservatories, the Botanic Garden also has another important reference collection—the dried plant specimens, carefully mounted and labeled, which are housed in fireproof steel cases. No botanic garden is complete without these preserved plants, for it is with their aid that identification and comparison of plants is accurately accomplished. They are essential to the proper installation and maintenance of plants in the gardens, and are frequently consulted by the staff members and visitors engaged in special investigations. Specimens are also loaned to botanists in other institutions for study, and similar courtesies of loan are extended to the investigators at the Botanic Garden.

The Herbarium of the higher plants was administered by the staff of the Department of Plants until 1934, when a separate Department was organized, and Dr. H. K. Svenson appointed Curator of the Herbarium. The care of the Herbarium of the lower plants was a part of the function of Dr. E. W. Olive, Curator of Public Instruction. Following the establishment of the Department of Pathology in January, 1921, the Fungous Herbarium has been administered by Dr. George M. Reed, Curator of Pathology.

The collection of flowering plants contains over 200,000 sheets, including a fine group of cultivated species and varieties. Specimens received from the Brooklyn Museum and from the Long Island Historical Society were the foundation for the collection, which has been constantly enriched by purchase, by exchange, and by gifts from universities and individuals.

Stress has been laid on the collection of plants of Long Island, that is, the local flora, and many specimens have been added to the herbarium during the past thirty years. One of the early American collections, 1815-1840, of which the Garden is fortunate in possessing several, was made by Mr. Stephen Calverley, a former Brooklyn resident.

A valuable collection of specimens from Manhattan, Long Island, and New Jersey, made by Professor John Torrey in 1816, is in the herbarium. The Garden also possesses the herbarium of Wm. Cooper, one of Dr. Torrey's associates, collections made by C. F. Austin, H. B. Croom, M. C. Leavenworth, R. D. Nevins, and other well known botanists of the nineteenth century.

Important acquisitions to the phanerogamic herbarium were made by the purchase of the A. A. Heller herbarium, mostly from Western United States, and the Henry Dautün collection from New Jersey, France, and Spain. Outstanding among the gifts to the collection of higher plants were the specimens from the Whitney South Sea Island Expedition (1921-1927), presented to the Botanic Garden by the American Museum of Natural History. Expeditions by staff members of the Garden to Bolivia and Ecuador yielded most valuable additions to the herbarium of plants endemic to those particular regions.

In the cryptogamic group of algae, lichens, liverworts, mosses, and ferns, are some of the earliest collections which the Garden owns. In 1940, the Botanic Garden arranged with the American Fern Society to take over and administer its collection of ferns. The collection of fungi now totals more than 80,000 specimens. In the course of the years, many important exsiccati have been added, among them: E. Bartholomew, *North American Uredinales;* J. B. Ellis, *North American Fungi;* D. Griffiths, *West American Fungi;* Seymour & Earle, *Economic Fungi;* H. and P. Sydow, *Fungi exotici,* and *Mycotheca Germanica.* The most important addition was the purchase, in 1922, of the collection of Dr. Franz Bubák, for many years Director of the Botanical Garden, Tabor, Bohemia, which contained more than 33,000 specimens, and included about 500 new species of fungi described by Dr. Bubák.

Small collections of plant specimens for class use have also been secured, including flowering plants, ferns, and fungi. A special collection includes specimens of trees, shrubs, and herbaceous plants from the gardens and conservatories, which have been in constant use in connection with the establishment and maintenance of the living plant collections at the Garden.

## PUBLIC INSTRUCTION

The second Curatorship established at the Garden was that of Public Instruction, and the appointment of Dr. E. W. Olive to develop this field took effect September 1, 1912. The scope of the activities of the Department was outlined in great detail in the *Record* for April, 1913. The work rapidly expanded, and Miss Ellen Eddy Shaw was added to the staff on September 1, 1913. On January 1, 1915, she was appointed Assistant Curator of Public Instruction, and one year later, Curator of Elementary Instruction, a separate Department being organized. Miss Shaw has developed this phase of the educational work into one of the outstanding features, which has brought world-wide fame to the Garden. An Assistant Curatorship of Elementary Instruction was established on January 1, 1916, when Miss Jean A. Cross was appointed, serving until December 31, 1919. Miss Elsie T. Hammond filled the position from September 1, 1921 until March 31, 1930, and was succeeded by Miss Margaret M. Dorward.

Dr. Olive resigned July 1, 1920. Since September 1, 1921, Dr. Arthur Harmount Graves has administered the activities of the Department of Public Instruction, developing and greatly expanding the work. In both Departments of Instruction, many individual instructors have had a prominent part in carrying on the classroom and laboratory studies, which deal with a wide range of botanical and horticultural subjects. Staff members of other departments have also aided in phases in which they were especially qualified.

Guidance of the educational program of the Botanic Garden for the past thirty years has been based on two fundamental principles. The first of these was the importance of public education and the dissemination of botanical knowledge. Upon one occasion Dr. Gager wrote: "Public education is the most important activity in which a botanic garden can engage .... Of what use to extend the borders of knowledge if the new knowledge is not made available to the public? Knowledge is power only when put into circulation, otherwise it is only potential energy, producing no results." "Botanical knowledge, like all knowledge, is primarily for the public; otherwise it has no justification. This thought

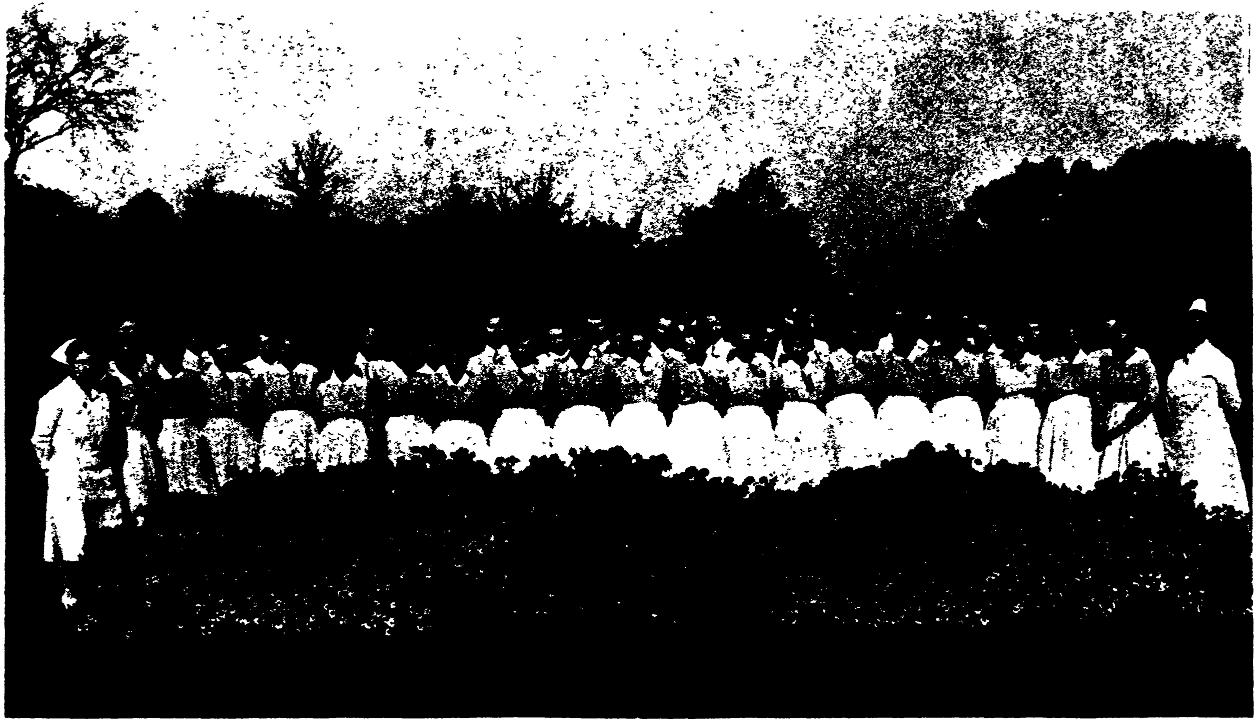

FIG. 21. Class from Kings County Hospital, enrolled in the Course for Student Nurses. Early blooming hardy Asters in foreground. November 4, 1931. (7322)

underlies our development of a strong program of public education for both adults and children."

The second principle was that of the value of obtaining botanical knowledge not from books alone, but from actual contact with living plants. The outdoor courses and those in which the students do actual gardening work, for which the Botanic Garden has become widely and favorably known, embody the idea of Agassiz, "Study nature, not books," which Dr. Gager was wont to modify to "Study nature *and* books."

"The educational program of the Brooklyn Botanic Garden includes anything scientific or educational based upon plant life." There are but few plans so wisely laid that they will remain the guiding principles for over thirty years of progress. Such, however, is the case with the tentative outline of educational activities of the Botanic Garden first presented in 1912 and, modified to meet present-day needs, is still being followed. The completeness of the plan is a credit to the far-sightedness of the Director.

Throughout the plan of the Garden runs the idea of education—of presenting information to the public in an acceptable and easily intelligible way. In the Systematic Section, the plants are arranged in a manner which illustrates their relation to each other and their place in the evolution of the plant world. The ornamental plantings are educational in their presentation of the principles of landscape design, of the cultivation and use of ornamental plants.

The plan of docentry by the Botanic Garden has greatly increased the value of the plantings and conservatories as educational features. Trips led by guides, whether for classes or for groups of interested individuals, result in a more complete understanding of the material presented. This is equally true of field trips held in connection with certain courses.

Special attention is called to certain features of the Garden when they are of particular interest by "story labels" placed nearby. These are marked "Exhibit of the Week" and have explanatory notes attached. They have been a very successful means of supplying botanical information.

Plants in the conservatories must also be well arranged and labeled. Descriptive labels were introduced to explain the origin,

Fig. 22. Class studying trees, November 6, 1931. (7308)

distribution, and economic uses of plants, or to present some biological principle such as evolution. By proper labeling and the service of instructors to explain special groups of plants, fundamental *concepts* of biology rather than the mere observation or *perception* of individual plants would be grasped by visitors.

Flower Days were initiated at the Garden in 1927. These have been held when the floral display of a particular group was at its best. The Days have served to give the members of the Garden an opportunity to become better acquainted with the plantings. Special Days have been held for the daffodils, Japanese Garden, cherry blossoms, lilacs, iris, waterlilies, and for other displays. Rose Garden Day and Chrysanthemum Day have become fixed features for June and November. A short talk is usually made by a member of the staff, or someone especially invited for the occasion, and this is followed by a tour of inspection of the flowers on the grounds. Flower Days, as far as we know, are original with the Brooklyn Botanic Garden.

A *Prospectus* of courses offered at the Botanic Garden is published each year. A great variety of topics is included; there are courses for the garden members and the general public. During the last few years these have been largely concerned with victory garden topics. Among the regular courses for members and the general public are those dealing with trees, shrubs, wild flowers, and ferns. Another group of courses is primarily intended for teachers, in which the elements of horticulture and gardening, greenhouse work, and plant culture, are taken up. Other courses are designed especially for the children and for special groups.

There is an agreement between New York University and the Brooklyn Botanic Garden which enables properly qualified graduate students to carry on independent investigations in botany at the Garden under the direction of members of the Garden staff. Opportunities for research are available in mycology, plant pathology, systematic botany, and morphology of the flowering plants.

A special course in medicinal plants for nurses, inaugurated in 1927, is unique. Two courses have been given by special request to employees of the Park Department. Following the war of 1917-1918, special training was given to soldiers in order to fit them for the particular vocation of gardening. The Garden is

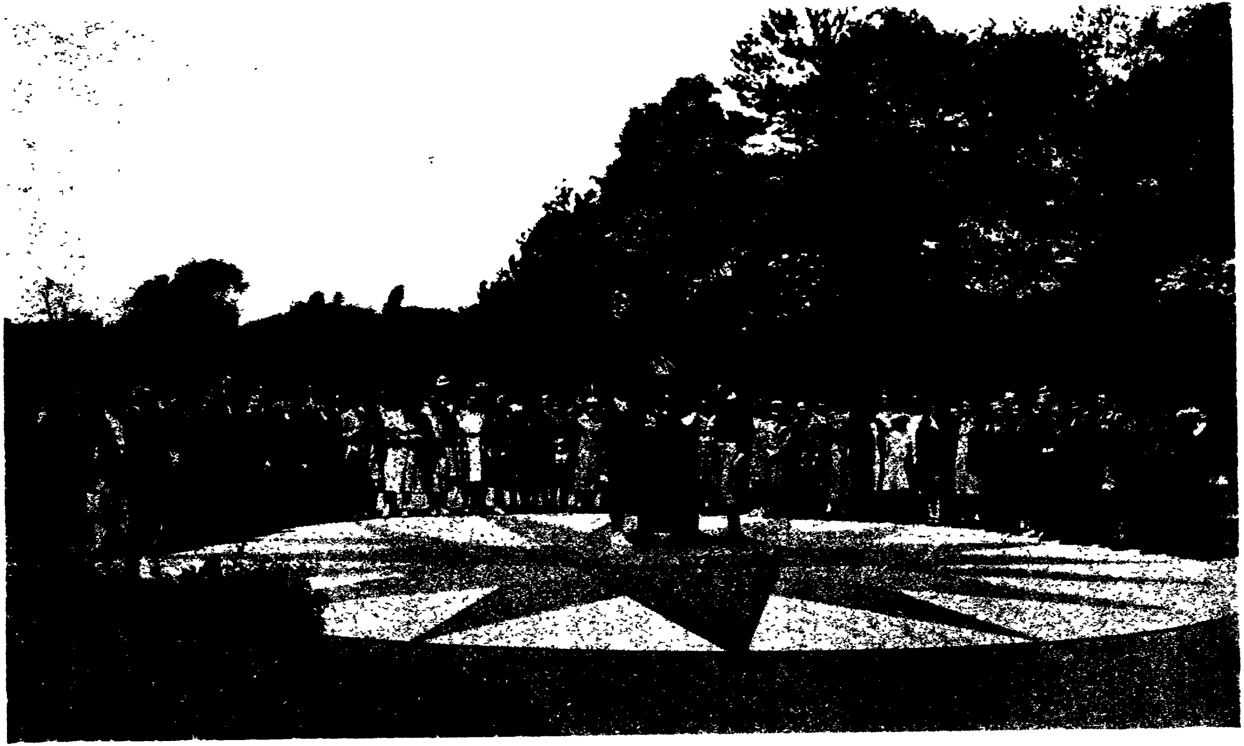

FIG. 23. Classes from Public School 44, Staten Island, visiting the Botanic Garden for outdoor study of plants, May 6, 1937. (9607)

looking ahead and expects to render a similar service to those returning from the present war.

In every course, the attempt is made to obtain information directly from the living material wherever possible. "It cannot be over-emphasized," said Dr. Gager, "that the study of botany is the study of plants, and not the study of what somebody says about plants." One indication of the extent to which this is practiced at the Garden is the fact that in 1936 it was estimated that 43,000 plants were grown in the educational greenhouses by adults and children.

Although attendance records in no way show the value of the educational work of the Botanic Garden, they are an indication of the extent of the Garden's influence in the community. In 1940, about 1,700,000 persons visited the grounds, 53,000 of these coming over the week-end of May 11th to 13th to view the cherry blossoms and flowering crab apples. In the same year, 146,000 visited the conservatories, 108,400 attended classes and lectures, and the total adult registration for courses was 1,359. In 1934, the registered attendance on the grounds of the Botanic Garden as shown by the turnstiles at the entrance gates was equal to nearly one-half the population of Brooklyn, and the actual educational contacts reached a figure equal to more than one-third the Brooklyn population. In 1925, only a little over 500,000 persons visited the Garden (less than one-third as many as in 1940) and in 1922, total attendance at lectures and classes was only about 63,000 (a little more than half as many as in 1940).

Adult education is not limited to the scheduled courses at the Garden, but includes public lectures either at the Garden, at schools, or at meetings of teachers, parents, and garden clubs. In these ways the Garden reaches out to many people, giving information and offering the opportunity to come to the Garden for further study. These lectures are given by many members of the staff, and often cover a branch of applied botany such as horticulture or pathology.

Public demonstrations and exhibits have been part of the Botanic Garden's program for stimulating interest in plant life. There have been exhibits at schools, at the Garden, and at places such as the American Museum of Natural History, the International

Flower Shows, the World's Fairs, and elsewhere, which required the cooperative work of most of the staff members, the major part of the responsibility resting on the Horticulturist. These exhibits are designed primarily to be educational, and to interest the public in the opportunities for further botanical study offered by the Garden.

The Bureau of Information, begun in 1911, is merely the combined knowledge of the staff utilized to the greatest advantage of the public by accurate scientific replies to their questions. This is detailed work which occupies a great deal of time of the Departments of Instruction, the Curators of Plants, Herbaria, and Plant Pathology, the Horticulturist, the Librarian, and others.

Information regarding the Garden and botanical matters is offered the public through various channels, and in this publicity for the Garden, Dr. Gager was especially interested. He realized very keenly how important it is from many points of view that the general public be kept informed of the Garden's activities—lectures, courses, exhibits, flowers in bloom, new or rare plants, progress of research, etc. The method adopted of sending out news releases, every week or two, to the various metropolitan newspapers won his hearty approval. From time to time he himself suggested topics for these news articles, and was pleased when releases were reprinted in newspapers in other parts of the country —once even by a newspaper in India.

Radio programs presented by the staff members have also been a regular feature of the publicity program.

The Botanic Garden was a co-sponsor, with the Extension Service of the New Jersey State College of Agriculture, of the Radio Garden Club which gave broadcasts on ornamental horticulture once or twice a week over WOR from March, 1932 until July 1, 1941, when the Club's affiliation with WOR and the Mutual Network was severed. During this entire period a member of the staff served on the committee which formulated the programs and was responsible, with other members of the staff, for an average of about one broadcast per month.

Since 1933, weekly programs throughout the greater part of the year have been given over WNYC. Programs have also been given from time to time over other stations.

## ELEMENTARY INSTRUCTION

"It was the wish of those who have been instrumental in securing the establishment of the Garden, that, in addition to research work, it should, to a greater degree that has hitherto been realized, or even attempted by botanical gardens, engage in the formal teaching of botany, and that it should become the means of encouraging and aiding the botanical work of local schools of all grades, elementary, secondary, and collegiate, both public and private." This wish has been ever kept in mind. A plan for education was worked out and elaborated as time went on. The most obvious beginning was to encourage classes of children to come to the Garden in school time with their teachers. The first high school class of seventeen girls arrived for instruction on October 6, 1913. From this time on, class after class of elementary, junior and senior high school students has visited the Botanic Garden. Colorful posters are sent to the schools each spring and fall, listing the lectures, demonstrations, and walks that may be arranged for. Lectures are planned to supplement the city and state syllabi of nature study and geography. Such talks as *Fall and Spring Wild Flowers; Bulbs: How to Plant and Care for Them; Economic Botany; Food Plants of the World; How to Start and Maintain Your Garden;* and many other subjects are given. These talks are usually illustrated by lantern slides and motion pictures. Experiments are set up to emphasize certain scientific truths.

The Garden has always encouraged small groups of visiting classes; it has been stated that we are working "educationally and not numerically," but of course there are various ways to reach larger numbers of children through special "days" like Rose Day and Lilac Day when many classes come by invitation, which emphasizes the importance of the occasion. To overcome the disadvantages of making contact with large numbers of children by lectures only, the plan was soon inaugurated of giving every pupil and teacher a syllabus containing important facts to serve as a basis for "follow-up" discussions in the classroom. A personal touch, characteristic of the relationship between the Botanic Garden and the schools, has been added by what is now a "tradition" of presenting to each visiting class some plants from the children's

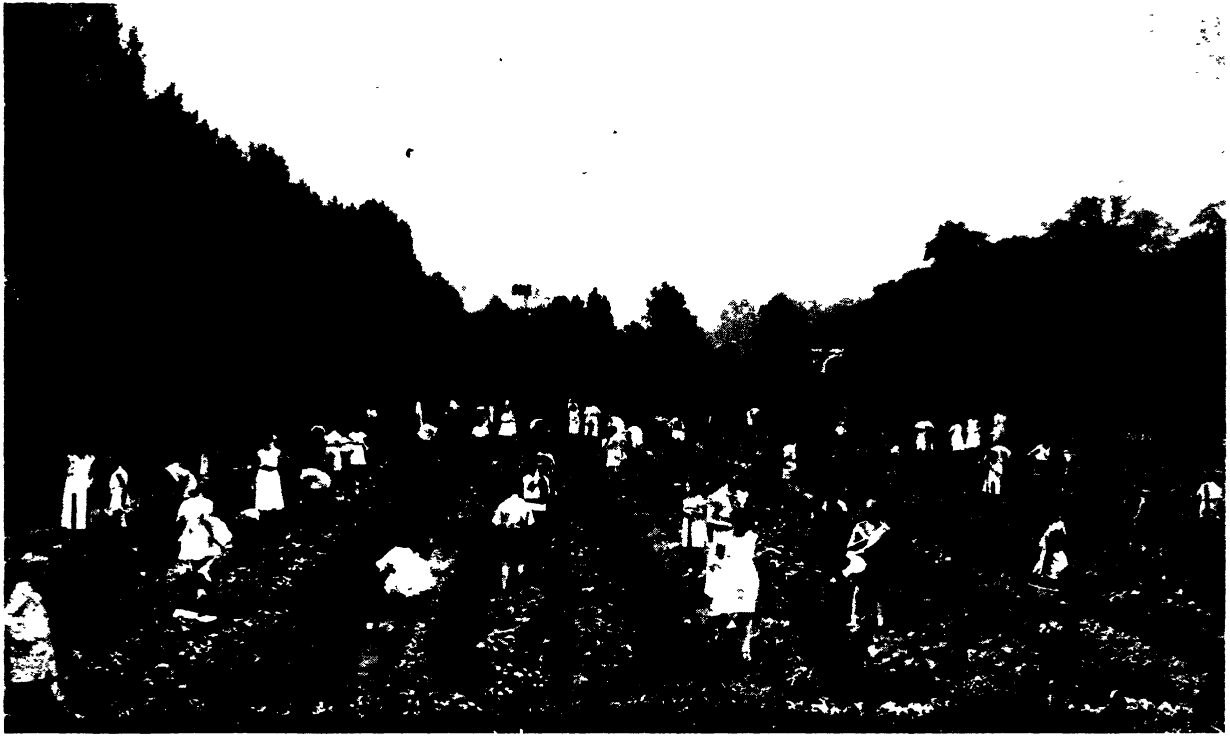

FIG. 24. Children's Garden, midsummer, 1935. (8858)

greenhouses for classroom decoration and use. This little act of interest has established a very friendly relation between the children, teachers, and the Garden itself.

Dr. Gager, in analyzing his data on the botanic gardens of the world, stated that no other botanic garden had arranged so extensive a program for adults and children as had the Brooklyn Botanic Garden. While stress may be laid sometimes on the educational importance of small numbers, still the following figures show that through our various methods we have been able to care for a goodly number of children. In 1913, 544 children visited the Garden for class lectures and demonstration; in 1920, nearly 23,000; in 1925, over 58,000; and in 1940, the number was over 67,000, about the maximum possible with the limited number of hours in the day, and the current staff and classroom facilities. In thirty years approximately 17,000 teachers have brought to the Botanic Garden over 1,000,000 pupils. Surely this is serving the children of the City as Dr. Gager wished them served.

Entirely separate from the lectures given to children from the schools are the lectures and courses for which children register voluntarily and which have no direct connection with the school. Dr. Gager felt very strongly that: "A lecture may serve a useful purpose as a means of stimulating a spirit of inquiry and in giving information not readily accessible in books and periodicals, but a program of education which includes only lectures to more or less passive listeners violates the fundamental principles of teaching and learning." It must have been a great satisfaction to him that children of their own volition started the Saturday morning classes. In October, 1913, a little group from the neighborhood requested that they have a greenhouse class in the one greenhouse then set apart for children's work. This was the beginning of our Saturday morning work for children and from then on this work has been entirely voluntary, requested by the children themselves, and also paid for in part by them. A small fee is given by each child for his classwork. About seventy-five children entered the first Saturday morning groups; in 1943, the registration for these classes was 683 for the year. Because of the limited facilities, this will necessarily remain about the same yearly.

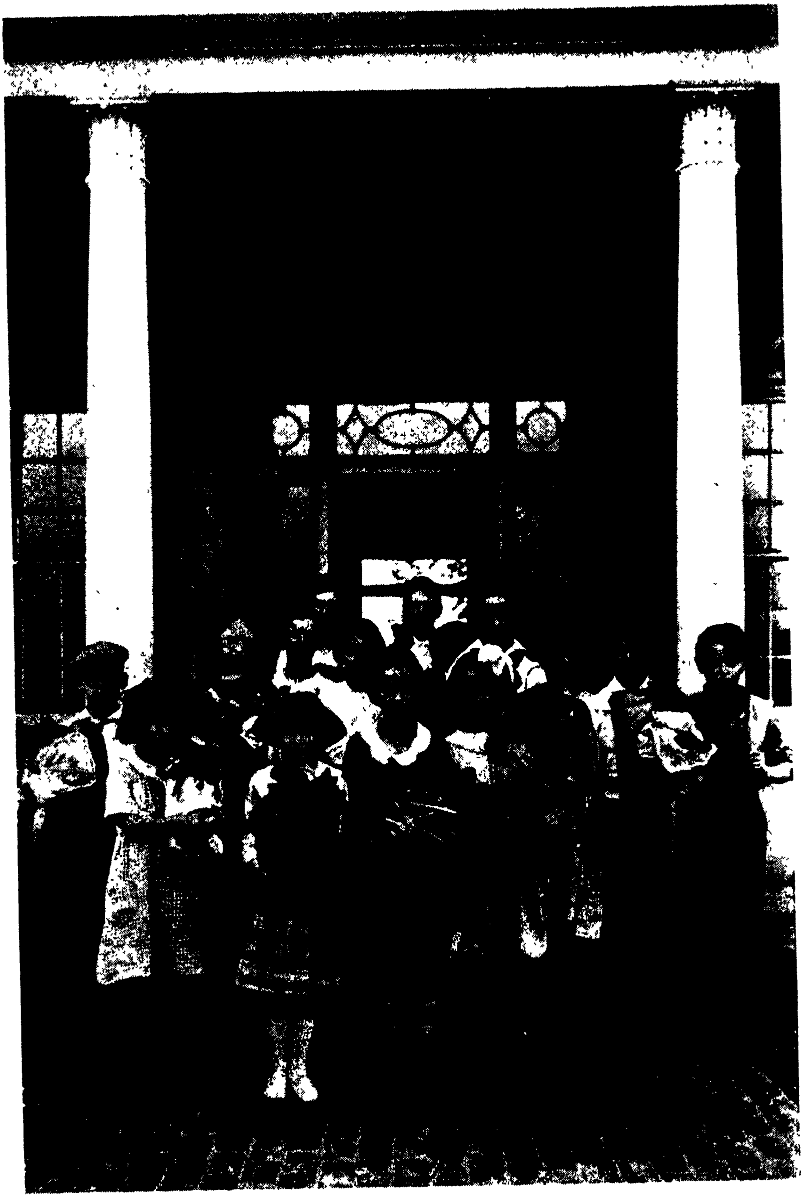

FIG. 25. Products of the Children's Garden: Main entrance to Children's Building, July 8, 1922. (4219)

These Saturday morning classes are arranged in series of fall, spring, and summer or outdoor garden courses. The children's year of Saturday work starts in the fall and interest at that time is centered about their greenhouse work. The instruction greenhouses, three in number, are unique in their plan and their set-up. The spring course includes nature study and preparation for outdoor gardens, with study of seed germination, sowing of seed, and making of garden plans. The summer work is in the outdoor garden.

An outgrowth of the garden work was the establishment of a summer school for teachers of gardening. This lasted for several years. Those taking the year's course formed themselves into an organization called the Garden Teachers Association. It has been a loyal and generous group contributing to funds for all appeals ever made by the Garden.

This Children's Garden project, a seasonal outgrowth of the Saturday morning classes, is an original pedagogical experiment which has been worked out with distinct success. In May, 1914, gardens in a temporary location were assigned to 125 out of the 180 children who applied. Today, in a permanent location in the southeast portion of the Garden, first utilized in 1916, there are 118 plots and two extensive flower borders. About 250 children register each spring for work in these plots.

A most useful and attractive center for the work is provided by the Garden House, which was erected with City funds in 1916, and the main room furnished by Mrs. James H. Post. The formal Shakespeare Garden, presented and endowed by Mr. and Mrs. Henry C. Folger, and other features in and around the House, are gifts of the children, teachers, parents, and friends who have taken a sincere interest or had an active share in the work.

The pattern, as laid down by the Curator of Elementary Instruction in accordance with the wishes of the Director, includes "self-discipline, knowledge at first hand, dignity of labor, financial support of our own work, generosity, ability to take a command and follow it, and ability to size up ourselves and our endeavors." The success of the gardens themselves, as measured by the crop, is relatively unimportant compared with the fulfillment of the above pattern. However, each year an attempt is made to show

Fig. 26. A school garden club. June, 1940. (10088)

the greatest possible crop obtainable on three-quarters of an acre of city land when the allotted garden space per individual is constantly worked.

An "Honor" day or Prize Day is held in October of each year when the awards are presented to those children who have covered the work. Four years ago Dr. Gager desired to give some prize to a boy and girl for outstanding work in the Children's Garden, and so the Director's Medal was decided upon and given for the first time in 1940. It was a great pleasure to him to do this and an equal pleasure for Mrs. Gager to continue the custom.

Prizes were originally awarded from a fund donated for the purpose by Mr. White, and the most important of these was the Alfred T. White Scholarship given for the first time in 1920, and continued through 1933.

Dr. Gager attended all Honor or Prize Days held for the children; their Christmas Party was not complete without him. The familiar sight of the Director and the smallest girl walking down the main aisle of the auditorium lingers with us. His talks to children carried the same grace and charm of language as did all his addresses.

Members of the Saturday morning classes call themselves the Boys and Girls Club. The Clubroom, where much of the indoor work centers, was made possible by a gift from Mrs. Helen Sherman Pratt, and opened in 1921. It offers to about 1,000 children yearly not only recreational and educational facilities, but an opportunity to assume responsibility and take pride in the Garden.

This short summary of the work gives little indication of the eager interest and spirit of the children who take part in this flexible program of study and pleasure carried out by the boys and girls of the Club. It is reassuring to know that the children's work at the Brooklyn Botanic Garden has been endowed to ensure its continuance. The fund, which now totals nearly $25,000, was obtained largely through the efforts of the Woman's Auxiliary of the Garden.

The project has not been limited to the gardens on Botanic Garden grounds. Through lectures, conferences, and correspondence, help has been given in establishing similar projects in other cities.

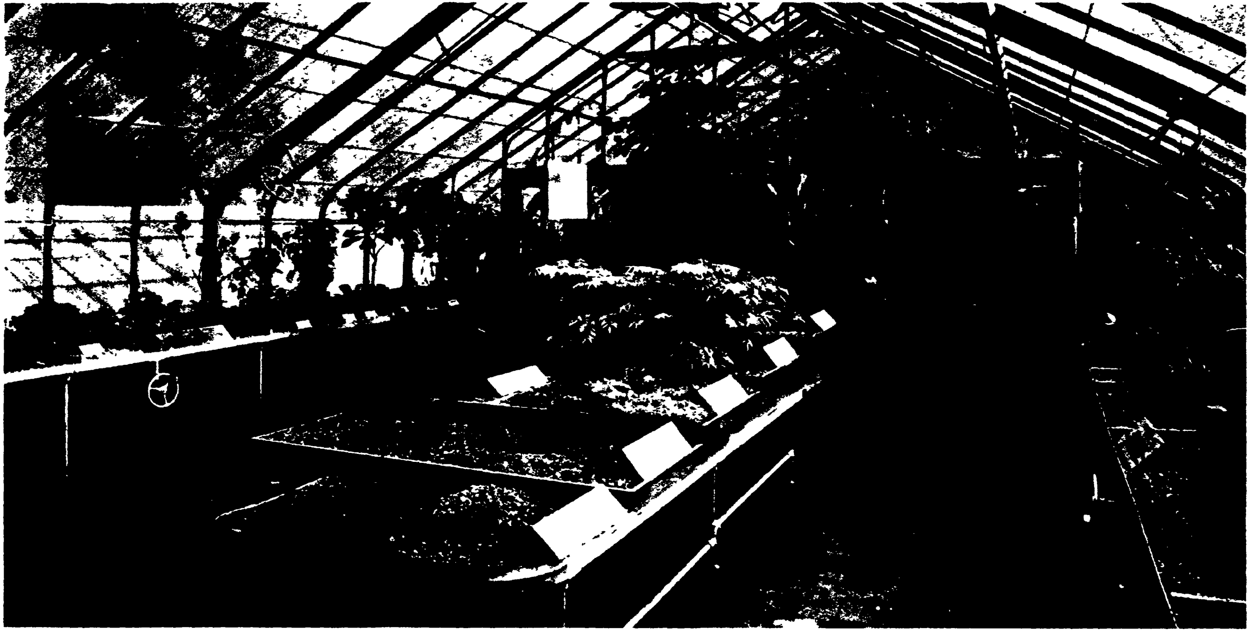

FIG. 27. Evolution of Plants Exhibit, Conservatory House No. 2. Center Bench: Liverworts and Mosses, Psilotum Group, Selaginella and Equisetum, Ferns, Cycads and Conifers. Right Bench: Monocotyledons by Families. Left Bench: Dicotyledons by Families. The Algae and Fungi are in the foreground not included in the photograph. January 26, 1940. 9913)

School gardens in Brooklyn have been encouraged, and a children's garden exhibit with about 2,000 exhibitors was held every year through 1925, with prizes awarded from funds donated for the purpose by Mr. White. These school exhibits were discontinued in 1925 because school and home gardening seemed to be well established. Beginning in 1930, a medal was awarded for several years to all schools having gardens up to a certain standard.

It is impossible for the schools to teach all their botany or nature study through lectures, visits, or demonstrations at the Garden, or by lectures in the classroom given by Garden instructors. Hence plant material is needed by the classroom teachers for instruction. The supply service, through which materials are given, lent, or sold to the school, greatly increases the opportunity of the Garden for school service. Assistance is given to nearly 7,000 teachers and over half a million children by means of living plants and plant parts and dried or preserved specimens for study. Every year one member of the staff presses, mounts, and labels hundreds of specimens of common flowers, weeds, and tree leaves and fruits for the schools.

In the spring of 1914, school principals were notified that the Brooklyn Botanic Garden would supply penny packets of seeds to pupils for backyard gardens. The request for 26,000 penny packets which was received, although pleasing to the Garden staff, presented a serious problem, since only 1,000 envelopes of seed had been prepared. It was, however, successfully handled, and over 5,000 Brooklyn children planted their own gardens at home or in school in 1914. In 1941, distribution of the seed packets passed well over the million mark.

The children's work has had wide educational publicity not only in this country but in lands across the sea. It was presented to educators and scholars at London University in 1931. Since the Garden was established, its lectures and classes have been attended by over 2,500,000 pupils and teachers. The Botanic Garden now has contacts with ninety-eight per cent of the elementary and all of the junior high schools in Brooklyn, as well as with many outside the Borough. Thus the correlation with the local schools functions through lectures and demonstrations to visiting classes and to classes at the schools; through the supply of study material for classroom use; and through guidance in conferences with botany and nature study teachers; and is therefore fulfilling the original plans for this part of the educational program.

Dr. Gager's last publication was an account of the Brooklyn Botanic Garden and the schools (*Chronica Botanica* **7**: 308-310. 1943). In this, he summarized the educational program for both adults and children, and mentioned that to him one of the most gratifying aspects of the work was the fact that many boys and girls carried on over a number of years their interest in the work at the Botanic Garden. From among them have emerged a few who have made botany or some of its branches their life work; but there are many more who have found the joy of broadened horizons and the pleasures of a lifetime hobby.

It always pleased Dr. Gager to see the children of eight (when they entered classes) and later to shake hands with many of these same children when they were leaving for college, realizing that they had spent eight or nine years of their lives under this roof, coming Saturday after Saturday in their own leisure time. This in itself is a monument to his far-sighted vision.

## RESEARCH

According to Dr. Gager, "The outstanding perennial need of botanic gardens . . . is more knowledge. And the necessary new knowledge is, of course, to be obtained only by research."

"The really indispensable condition for progress is the spirit of inquiry," wrote Dr. Gager in one of his annual reports, and it is appropriate that we pause and evaluate this privilege in terms of past accomplishment at the Botanic Garden, in order to appreciate its worth, and foster its continuance wherever and whenever possible. "To the end of time, as we firmly believe, truth must be ascertained by the well-tested method of observation, inference and deductive verification," he stated before a group of scientists in 1917, and toward an appreciation of this belief by laymen he worked unceasingly during the entire period of his Directorship. He frequently requested funds to support research, for he felt that botanic gardens should not become mere "depositories and purveyors" of botanical knowledge; " . . . to a nation, research is a moral obligation," he once wrote, and added: "It is the very life blood of . . . botanic gardens if they are to be more than mere show places and retailers of second-hand information." He was fully aware, as most people are not, of the debt which all of us owe to scientific research, and he felt that it was the obligation of a botanic garden, which constantly used and benefited from the researches of others, to make its own original contributions to botanical knowledge. Research was one of the primary objects for which the Botanic Garden was founded and is one of its "largest opportunities and obligations as a botanic garden."

Dr. Gager favored the continuance of research in pure science, stating: "The surest way to make botany useful is to follow out a program of research in pure science; . . . That there can be no applied science unless there is first something to apply, is a truism." He once made the statement that "It would, no doubt, be misleading to say that the important thing about research is not the results, but the continuation of it; and yet there is an element of truth in that assertion." The emphasis has not been laid on the immediate results, but on a continuation of the spirit of inquiry. Although, according to him, "There is no place for the useless,

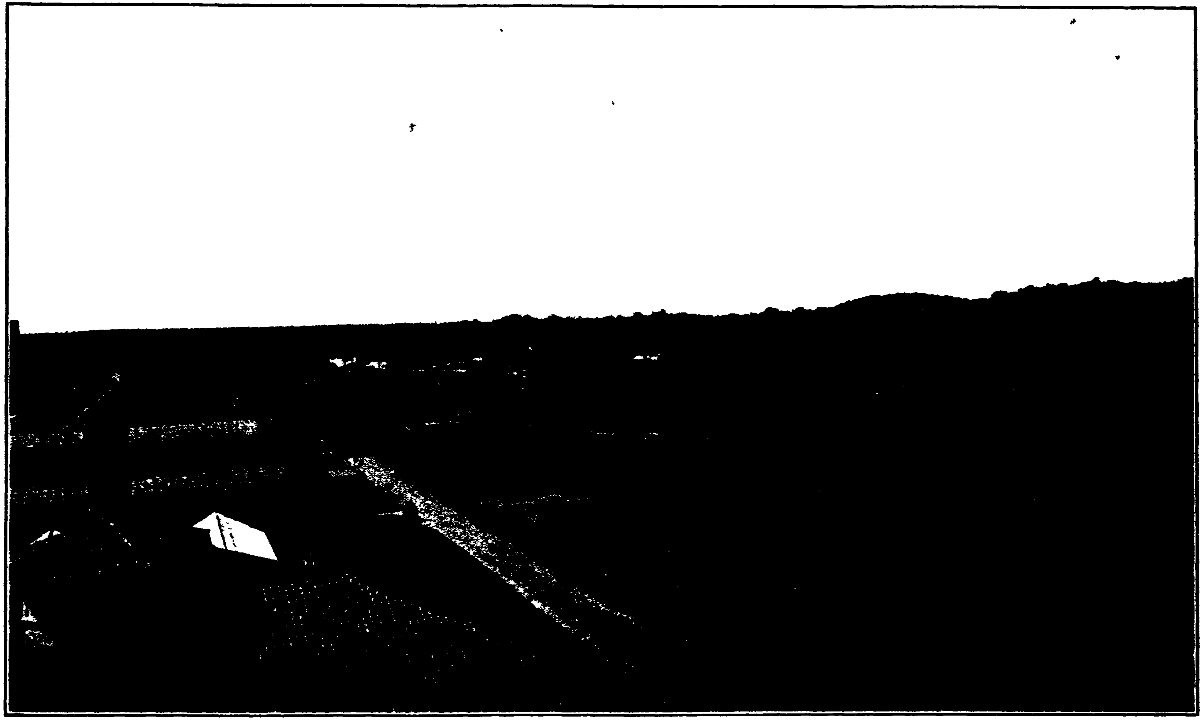

Fig. 28. War Gardens, 1918. Southern part of the Botanic Garden, taken from the Laboratory Building. June 19, 1918. (*2727*)

usefulness may not always be at once apparent," and thus if the results of research at the Botanic Garden have not always shown immediate practical applications, they were none the less commended by the Director. On the other hand, he was also of the opinion that the "practical ends of plant breeding, crop production, and disease control" should not "be minimized," and thus he always appreciated scientific observations and discoveries which had immediate practical applications. It was his wish that the results of research at the Garden would constitute a service to the public; "The Brooklyn Botanic Garden is the daily beneficiary of research done elsewhere; it is highly fitting that we should also be making contributions to our knowledge of plant life as a service not to the few, but to the general public."

All of the members of the staff were afforded the opportunity to carry on investigations in phases of botany and horticulture in which they were interested, insofar as their administrative and teaching duties permitted. The members of two Departments—Plant Breeding, established in 1913, and Pathology, in 1921—devoted practically all of their time to research. The results obtained have been published as four *Memoirs* of the Botanic Garden, and ninety-nine *Contributions*, the latter being papers first published in botanical journals and issued as reprints. A few of the *Contributions* were of a general or educational nature, but by far the larger number were accounts of intensive studies on specific botanical problems.

Because of the demands of administrative duties, Dr. Gager personally found but little time to carry on investigation. However, he continued his interest in the influence of radium rays on plant life and, in cooperation with Dr. A. F. Blakeslee, published a paper in 1927 on their experiments, in which ovaries of Jimson Weed were treated with radium emanations to induce mutations. The treatments were successful, and several mutant types, never before observed, were obtained. Two other papers, one published in 1916 and the other in 1936, reviewed the studies on the problem of the effect of radium rays on plant life.

During his first summer at the Botanic Garden, Dr. Gager accompanied Dr. N. L. Britton, Director-in-Chief of the New York Botanical Garden, and Mrs. Britton, on a trip to Western Cuba for the purpose of collecting plants. Approximately 3,500 living or preserved specimens of plants were obtained, along with more than 120 photographs of the vegetation of Cuba. This was the first of many expeditions which have been made by members of the staff, and the observations and botanical information obtained have not only been published, but have also served as the basis of lectures for the diffusion of botanical knowledge.

Studies along ecological lines, dealing with the vegetation of the vicinity of New York, were undertaken by Mr. Norman Taylor, the Curator of Plants. Papers were published on the plant life of the pine barrens of New Jersey, the growth forms of the flora of the vicinity of New York, the significance of the White Cedar Swamp, Merrick, Long Island, and a longer *Memoir* on the vegetation of Montauk, Long Island. With Barrington Moore, a *Memoir* on the vegetation of Mount Desert Island, Maine, and its environment, was published.

Dr. Alfred Gundersen, Curator of Plants, has been especially interested in the classification of the flowering plants, and he has made extensive studies of the floral structure of members of several families with a view to determining their proper sequence in a system of classification. Botanists are fairly well agreed on the classification of most of the families of the dicotyledons, but the proper position in the scheme of classification of some of the smaller families is a matter of dispute. The studies on floral structure and placentation have been illustrated by excellent drawings made by Miss Maud H. Purdy, the Botanic Garden artist.

Dr. Gundersen has also been interested in the lilacs, and has assembled a collection of species and many varieties of great ornamental value to gardens.

Dr. Henry K. Svenson, Curator of the Herbarium, has published an exhaustive study on Elocharis, a world-wide genus of sedges, with most of its species in the New World. The publication included a résumé, indices, and maps, and illustrations of approximately 150 species distributed over the whole world. Another study has been made on the sedges of Panama.

In 1930, Dr. Svenson went to the Galapagos Islands and Cocos Island as botanist of the Astor expedition. Over 500 flowering plants and ferns were collected, chiefly on Indefatigable Island in the Galapagos group, and Cocos Island, including over fifty species hitherto unreported from that region. Upon his return to Brooklyn, these plants were identified and, in 1933, the manuscript on the Galapagos Flora was completed, after he had made a trip to England to check the plants collected on expeditions of English botanists. In 1937, the study of the ferns of the Galapagos and Cocos Islands was published. A valuable opportunity came to him in 1941, as recipient of a John Simon Guggenheim Foundation Fellowship, to spend three months in Ecuador for the purpose of studying the geographical distribution of plants, and specifically to compare the flora of that part of the coast of South America with the flora of the Galapagos Islands. Plants were collected in Ecuador, and a comparative study is being made with those collected on the Galapagos Islands. Investigations on the flora of Tennessee have involved trips to Middle Tennessee to study, with the cooperation of Prof. Jesse M. Shaver of Nashville and the Tennessee Academy of Science, the flora of a section in which the wild life is doomed, due to industrialization following the Tennessee Valley Authority project. Over 8,000 plant specimens have been collected and these, together with numerous photographs, serve as the basis for a discussion of the Tennessee flora.

Dr. Edgar W. Olive, the first Curator of Public Instruction, was especially interested in the cytology of the rusts. With Prof. Whetzel of Cornell University, an expedition was made in 1916 to Puerto Rico to collect and study fungi. They found the climate and other conditions unusually favorable for the growth of parasitic fungi, and collections of more than 500 rusts and other parasites, many of them new to science, were made. Studies on the life history of some of the common rusts of Puerto Rico were carried out. Duplicate type specimens of fungi collected on this trip are now in the fungous herbarium of the Garden, as well as in the Department of Plant Pathology, Cornell University.

Dr. Arthur Harmount Graves, in addition to his activities as Curator of Public Instruction, with the assistance of members of his staff, has carried on investigations on the breeding of chestnuts for the purpose of obtaining trees which will be blight-resistant, combined with the upright, vigorous growth, which characterized the American chestnut and made it so excellent for timber. Native

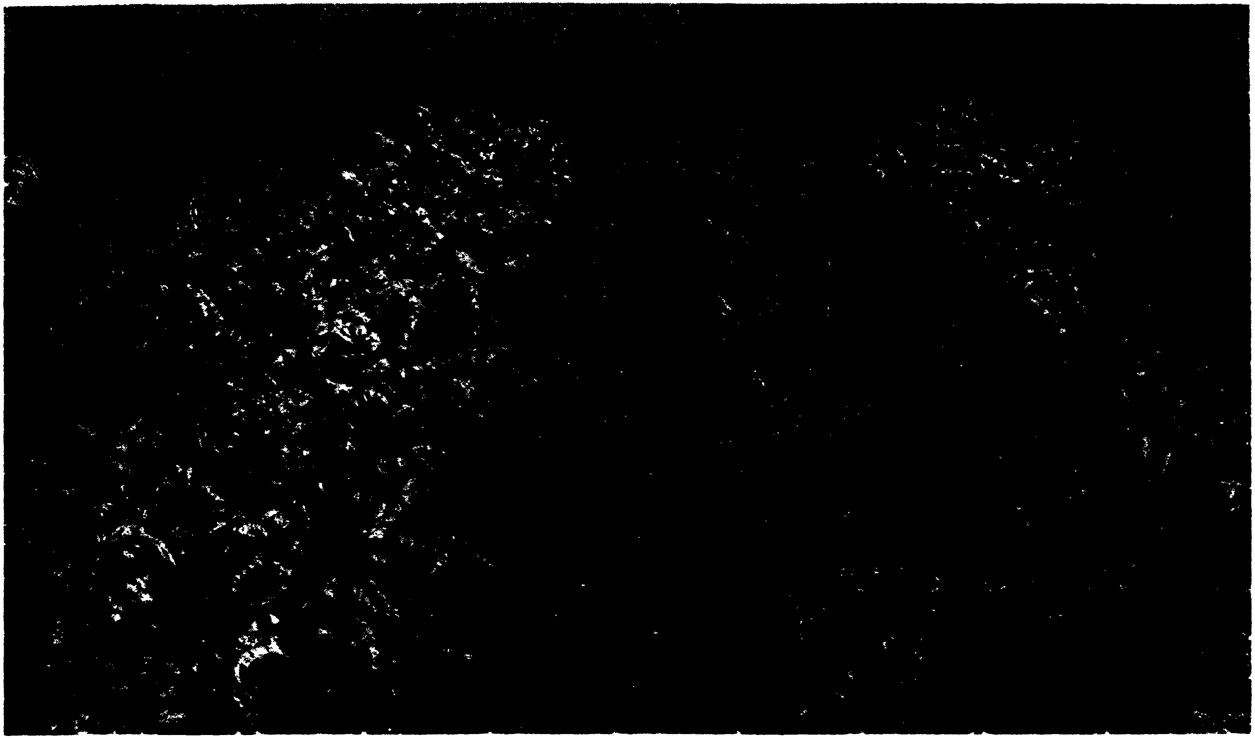

FIG. 29. Victory Garden, showing beet., carrots, parsnips, and Swiss chard, June 23, 1943. (10711)

chestnuts which showed partial resistance to the bark blight were first successfully crossed in 1931 with resistant Japanese species, some of which were offered for the experiments by owners of private estates. The nuts so obtained were planted, and over a period of about fifteen years some 1,000 hybrids from such crosses have been grown, together with a collection of nearly all species of Castanea in the world. The seedling trees have been set out at the Brooklyn Botanic Garden, on private property at Hamden, Connecticut, and in other places which have been offered through the coöperation of Prof. Ralph C. Hawley of the Yale School of Forestry, Dr. D. F. Jones of the Connecticut Agricultural Experiment Station at New Haven, Dr. W. W. Herrick, Sharon, Conn., The White Foundation, Litchfield, Conn., The Avon Old Farms School, Avon, Conn., and Mr. Archer M. Huntington, Redding Ridge, Conn., and others.

In 1934, three of the Japanese-American hybrids bloomed, so that a new generation could then be started for the first time. Beginning in 1934, crosses of American and Chinese species were made and, more recently, crosses of Japanese-American hybrids with Chinese trees. Records are kept of the rate of growth and disease resistance for each individual and the tallest and most resistant trees are selected for further breeding. The aim at present is to develop a race of chestnut trees of the desired character which, by inter-pollination, will each year yield a quantity of nuts for reforestation.

In addition to breeding for a timber tree, the chestnut work has also for its purpose the breeding of a blight-resistant tree of robust growth and insect resistance, which bears nuts of a high quality, and which exhibits resistance to cold and drought.

Not only by experimental breeding, but also by making use of the native chestnut trees or their sprouts, still found growing here and there throughout the natural range of the chestnut, is there a possibility of discovering a blight-resistant tree. In response to requests, nuts have been received from many of the States within this range and, as a result, more than 300 native chestnut trees are now growing at Hamden.

The work has been conducted in coöperation with the Division of Forest Pathology, Bureau of Plant Industry, United States

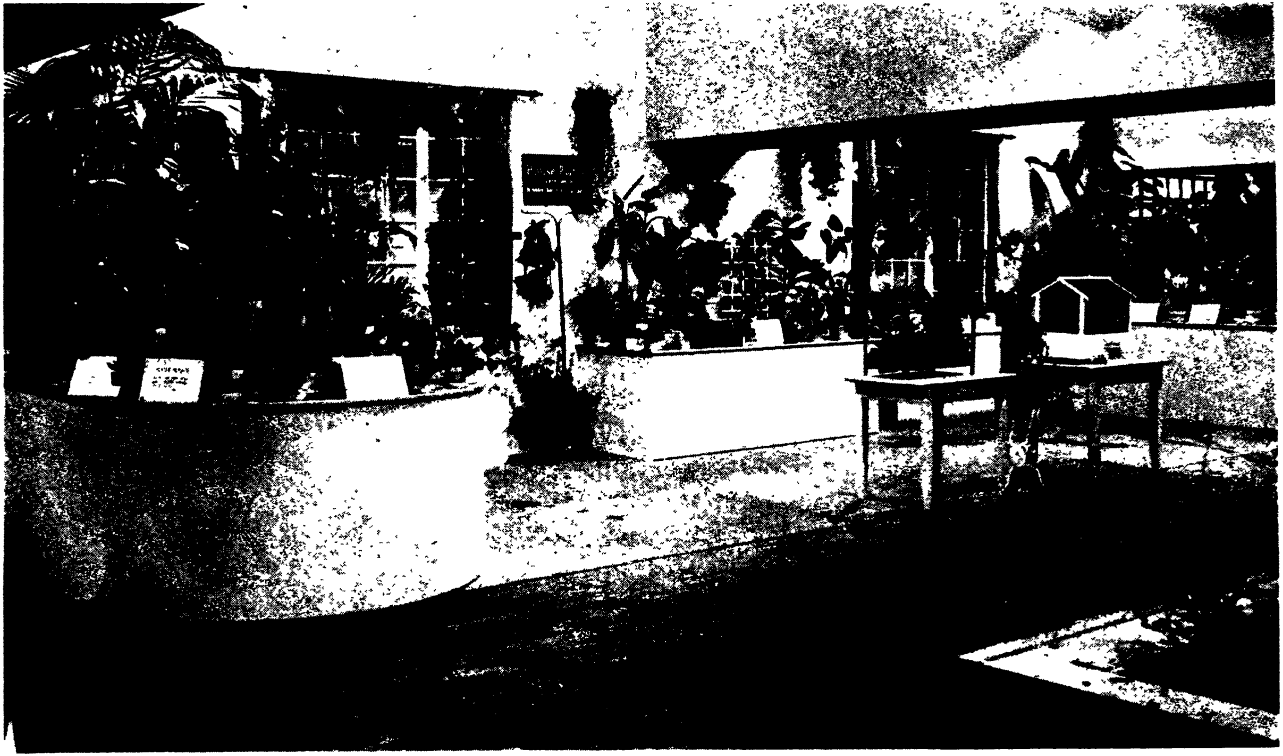

Fig. 30. Exhibit of house plants. International Flower Show, March 13, 1939. (9782)

Department of Agriculture, and some of the costs have been defrayed by it. Special funds have been received from Mr. Godfrey L. Cabot of Boston, and also Grants-in-Aid from the American Academy of Arts and Science, the National Research Council, and the National Academy of Sciences. The North-Eastern Forest Experiment Station and the Connecticut Experiment Station at New Haven have coöperated by lending trained technical assistants during the flowering season for making pollinations.

The members of the Department of Plant Breeding, organized in September, 1913, with the appointment of Dr. Orland E. White, have devoted practically all of their time to investigation. The genetic studies on peas, which were the most extensive, were conducted in order to obtain information concerning the factors for characteristics such as height, color and shape of the pod, seed-coat color pattern, foliage and flower color and their interrelationship, as well as the influence of environmental differences on the expression of these factors, and the relation between these factors and the chromosomes. More than 200 varieties of peas, assembled in collaboration with the Bureau of Plant Industry, United States Department of Agriculture, were used in these extensive experiments with a view to discovering the manner of inheritance of all the character differences of peas and, in large measure, this has been accomplished.

The inheritance of endosperm color in maize, as well as various characters in castor beans, including stem color, bloom on the stems and fruit capsules, dehiscent and indehiscent seed pods, and seed coat colors, was investigated.

Another line of investigation has been concerned with fasciation phenomena in plants, the study of certain floral abnormalities in Nicotiana having been made. Two papers have been published dealing with the cold resistance of certain plants, one dealing with the geographical distribution of some herbaceous, perennial, and woody plant groups, and the other with the mutation, adaptation to temperature differences, and geographical distribution in plants.

Dr. White accompanied the Mulford Expedition for the Biological Exploration of the Amazon Valley, June 1, 1921 to April 14, 1922. The collections of the botanical members of the expedition numbered about 13,000 specimens, representing over 2,000

FIG. 31. Knot Gardens in the Herb Garden: Sweet Violet (*Viola odorata*), Lavender Cotton (*Santolina*), Germander *Teucrium Chamaedrys*). Surrounding the Knots are Culinary and Medicinal Plants, segregated. September 12, 1941. 10317)

species, many of which were native economic plants. Seeds of about 200 species of herbs, trees, and shrubs, were collected.

The Curatorship of Plant Pathology was established on January 1, 1921, with the appointment of Dr. George M. Reed, by means of funds provided by Mr. Alfred T. White and two friends. The members of the Department have devoted their time almost exclusively to research. Specific problems have been investigated by assistants and graduate students, the results being embodied in theses for which they received advanced degrees at Columbia University or New York University.

A definite program for the investigation of disease resistance in plants was developed, including such topics as: the determination of the susceptibility of resistance of particular hosts, or varieties, to pathogens; the influence of environal factors upon the resistance and susceptibility of hosts; the existence of physiologic specialization of pathogens; and the inheritance of the disease-resistant quality.

For the study of disease resistance along the proposed lines, diseases of cereals have proved to be especially adapted, and most investigations have been made with the cereal smuts, since they were particularly interesting for these studies. The smut pathogen usually invades the host in the seedling stage, but shows no evidence of its presence until the heading, or flowering, time of the grain, weeks or even months later.

Physiologic specialization of plant pathogens has been known for a long time, but it was not until 1921 that this phenomenon was observed in the smuts. The first evidence of physiologic specialization in cereal smuts was obtained in studies made at the Botanic Garden, and five specialized races of covered smut of barley, two of the loose smut of oats and two of the covered smut, and ten races of the two species of covered smut of wheat were demonstrated in 1924-1927. Most attention has been paid to the oat smuts, and at the present time more than thirty races of loose smut and fourteen of covered smut are known to occur.

The characteristics of certain races of oat smuts were compared in their growth on artificial media in the laboratory, and new races have been originated by combining pure line cultures derived from two distinct races.

FIG. 32. Twenty-Fifth Anniversary Group at Brooklyn Botanic Garden, May 15, 1935. (8993)

Cytological studies on the relation of the oat plant to the loose smut of oats have been carried out. Along another line, the study of a possible correlation in the growth ratês of oats and of the covered smut in regard to infection was made. The investigations with sorghum smuts necessitated a detailed study of the effect of nutrients, moisture, and other environal factors on the percentage of infection in susceptible varieties of sorghum, in order to find the best conditions for obtaining the highest percentage of infection, and environal factors which retarded seedling growth seemed to increase the percentage of infection; resistant varieties, however, showed no change in their response.

The discovery of varieties fully resistant or susceptible, the working out of environal factors necessary to obtain complete infection of all individuals of susceptible varieties, the knowledge of the existence of physiologic races and the necessity of taking them into account, have made it possible to make progress on the study of the genetics of resistance. Many crosses have been made between oat varieties differing in their behavior to specific races of smut, and the resistance or susceptibility of second, third, and later generations has been determined. In most cases the resistant quality is inherited on a simple one-factor basis. In others, however, the relation is much more complicated. Extensive studies on the inheritance of smut resistance in sorghums have also been carried out.

The investigations in pathology have been conducted in coöperation with the Division of Cereal Crops and Diseases, United States Department of Agriculture, investigators in some of the State Experiment Stations, and practical breeders for the improvement of cereal crops.

In connection with the cultivation of the iris collection at the Garden, serious damage caused by the iris thrips was noted. Extensive experiments were conducted in coöperation with the Bureau of Entomology and Plant Quarantine in Washington, and effective methods of control were discovered. The insect could be killed by dipping the rhizomes in hot water for a given length of time. More convenient methods, however, were found in the use of derris and nicotine sulphate sprays. It was further found that fumigation with methyl bromide could be safely used.

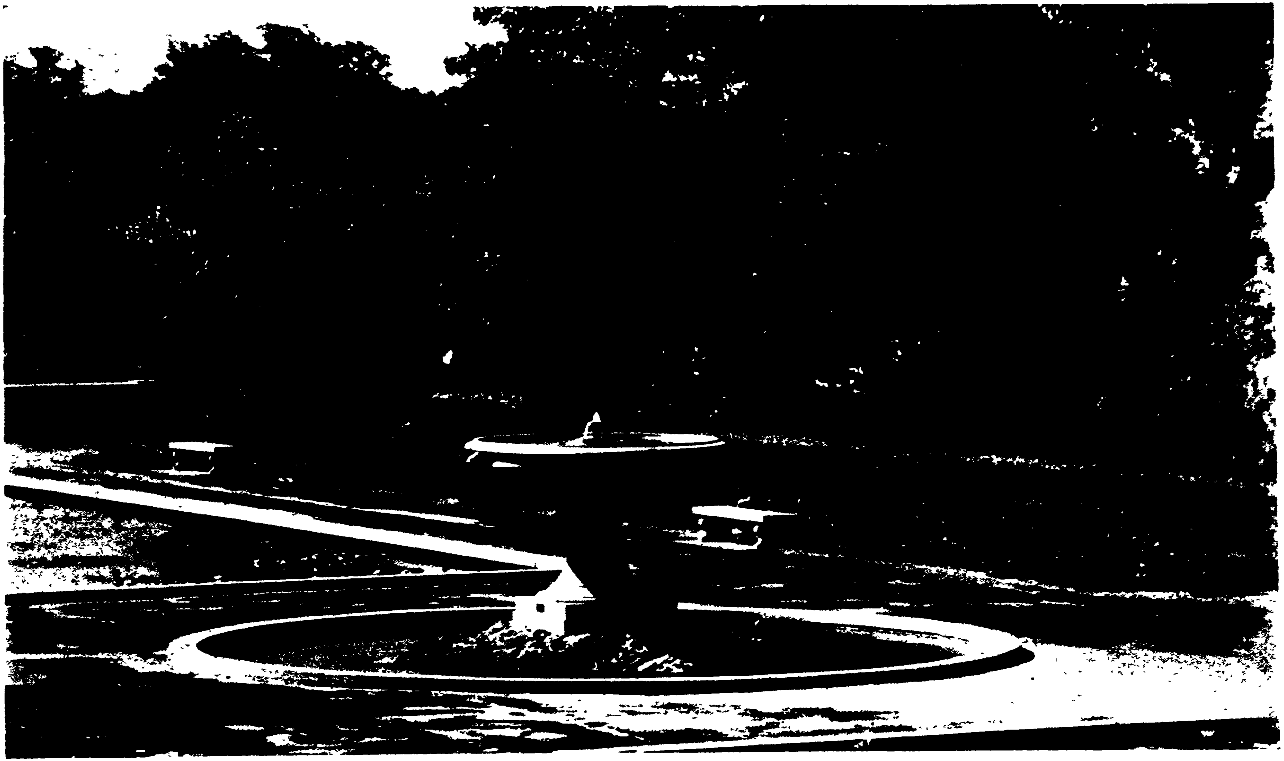

FIG. 33. Jenkins Fountain, Conservatory Plaza, September, 1930. (7030)

The work with the iris project led to hybridization between different varieties and species. A particularly valuable discovery was made in the hybridization of iris which had been collected in Southern United States, particularly in Louisiana. Previous to 1920, only a few species of iris were known in the South. Soon after 1920, however, a large number of different kinds of iris of the Fulva-Foliosa group were discovered by botanists and recorded as species new to science. Hybridization experiments carried on at the Botanic Garden between the two species—*Iris fulva* and *I. foliosa*—led to the production, in the second and later generations, of a wide range of forms differing in vegetative and flower characters. The conclusion has been reached that probably most of the so-called "new species" described from Louisiana are merely hybrids between two or three species, which have been known for a long time. An excellent set of watercolors of these has also been made by the artists already mentioned.

The first Resident Investigator at the Brooklyn Botanic Garden was Dr. Ralph E. Benedict, appointed in April, 1916. He was especially interested in the ferns, and undertook an investigation of the horticultural variations of the Boston fern, for which space was furnished in the Botanic Garden greenhouses. Grants from the American Association for the Advancement of Science made possible visits to the fern growers' establishments, most of the new types having appeared in greenhouses around the larger eastern cities. Through correspondence, every reported new type was obtained, from as far south as Louisiana and as far west as Colorado, and later from England and France, where similar series of new types had appeared. Later, the Garden's own series of spore-produced variations were developed from a single Boston fern type which was spore-fertile.

This study was begun at an opportune time, since the first interest in the new Boston fern sports had arisen in the late nineties with the appearance of the Boston fern itself near Cambridge, Mass., and two or three other new forms near Boston and New York. By 1915, the search for new variations was at its height, because of the possible commercial value of the new types.

The studies of the variations of the Boston fern, a most distinctive phenomenon in the field of genetics, have been published in several papers.

Dr. Ralph H. Cheney was appointed Resident Investigator for Economic Plants in July, 1931. His research program was developed around two major topics—the beverage plants, and the medicinal plants of the world. Taxonomic and geographic studies were made, followed by experimental investigations to extend the knowledge of the effects of the beverage and medicinal extracts, in comparison with the effects of the purified active principles derived from them, upon the normal physiological processes in man. Chief attention was devoted to the caffeine-yielding plants, and the results have been published in domestic and foreign scientific journals. After the beginning of the present war, a survey of the availability of essential drug and insecticide plants in the nurseries of the northeastern United States was completed, as a unit in the service record of the Botanic Garden to the national emergency.

## Coöperation with Other Organizations

The Botanic Garden has coöperated with many organizations in carrying on activities in botany and horticulture. The Garden is one of the three divisions of the Brooklyn Institute of Arts and Sciences, and has assisted the Department of Botany of the Institute in the arrangement of meetings, lectures, and demonstrations. The Garden has also coöperated with the Brooklyn Museum in furnishing material for various types of exhibits.

Coöperation with the Board of Education and the New York public schools included work by the Department of Elementary Instruction of the Garden and the Director of the City School Garden on various courses and projects. In addition, a representative of the Botanic Garden has served on committees of the Board of Education in planning courses in botany and nature study. "In service credit" for courses offered at the Garden is given by the Board.

Dr. Gager took a prominent part in the activities of the Horticultural Society of New York, serving as Vice Chairman of the Board of Directors for several years. Frequent exhibits have been made by the Garden at the Horticultural Society's shows, a gold medal being awarded for an exhibit of ornamental fruits at the Victory Garden Harvest Show (1942), and a silver medal for an exhibit of cereals, featuring hybrid corn (1944).

The Garden has participated in the International Flower Shows since 1918, and for many years Dr. Gager was a member of the Flower Show Committee. For its exhibits, which have been under the direction of the Horticulturist, Mr. Montague Free, the Botanic Garden has received numerous awards, including gold medals for the demonstration of plant propagation (1933), methods of pruning (1934), plants for rock gardens (1936), exhibit of xerophytes (1937), ivy garden of seventy-six species and forms (1941), for which it also received the Bulkley Gold Medal of the Garden Club of America, and methods of graftage (1942). Silver medals were received for a collection of crocus species (1933), an exhibit of garden operations (1935), a knot garden with herbs (1938), and an exhibit of carnivorous plants (1940).

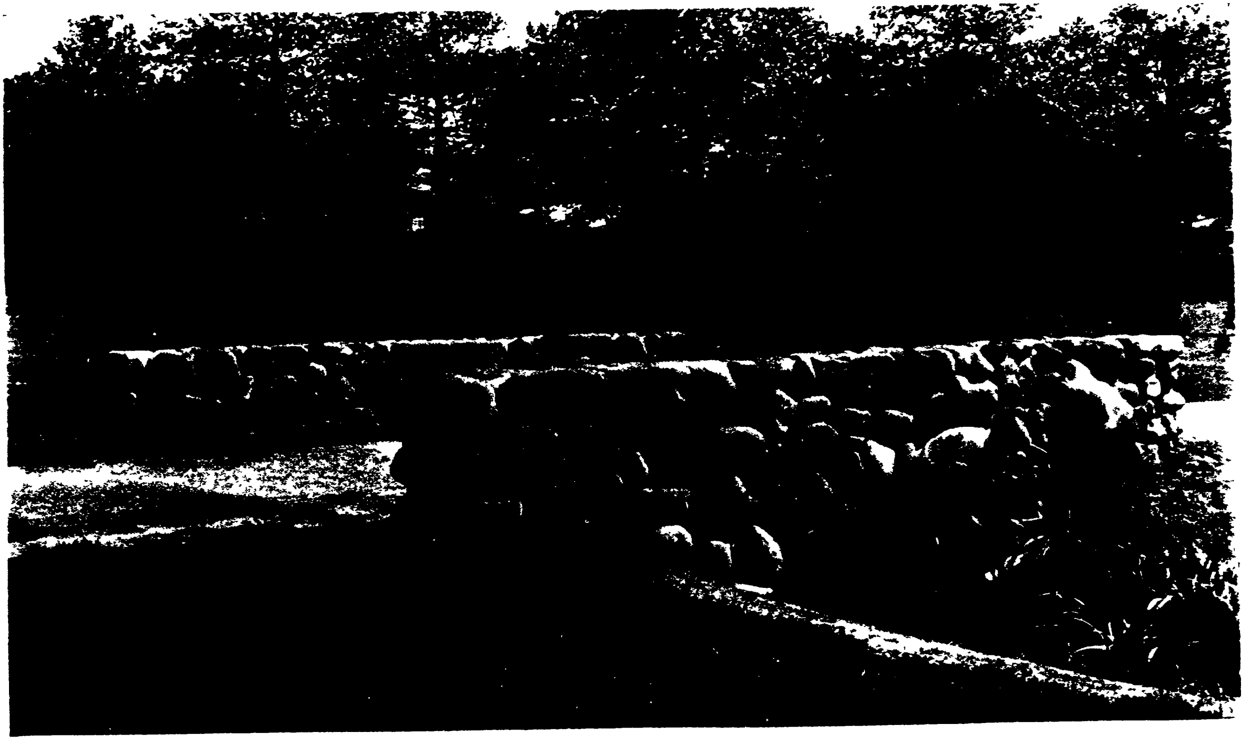

FIG. 34. Boulder Bridge—one of the glacial boulders, September 12, 1929. (6811)

The Garden won its first gold medal in 1921, by an exhibit of ferns at the Massachusetts Horticultural Society Show at Boston.

Dr. Gager took an active part in organizing Hortus, Inc., which sponsored "Gardens on Parade" at the World's Fair in New York in 1939 and 1940. Herb and knot gardens were arranged in a section of the grounds, and a large number of Japanese iris were also exhibited in both years.

In 1920, the American Iris Society arranged for the establishment of a test garden for Japanese varieties of iris. A very complete collection of varieties and species has been assembled. Not only have the American nurserymen contributed generously, but many varieties have been imported from abroad, especially from growers in England and France, as well as Japan, the native home of the Japanese group. The studies involved the methods of culture, the correct names of varieties, and possible methods of classification for easy identification. A valuable contribution to the records of the Japanese iris is the fine collection of watercolors made by Miss Maud H. Purdy and Miss Louise B. Mansfield. A selection of these was exhibited at the Century of Progress Exposition in Chicago in 1933, and the New York World's Fair in 1939 and 1940.

In 1930, the Garden entered into an arrangement with the American Fern Society which provided for the care and administration of the society's library; in 1940, the fern herbarium of this society was deposited with the Garden.

The Garden has offered opportunities for advanced research in botany to students who wished to utilize its facilities. Many young men and women have carried on investigations in the Garden's laboratories. The results have been accepted as theses for advanced degrees at both Columbia University and New York University and, during the years, six young people have utilized the facilities of the Garden for their research, and obtained the doctor's degree.

In connection with the research work, mention has been made of the coöperation with the United States Department of Agriculture in the study of cereal diseases, breeding for chestnut blight resistance, and the control of iris diseases and pests. During the first world war, Dr. Olive carried on a survey of fruit diseases in

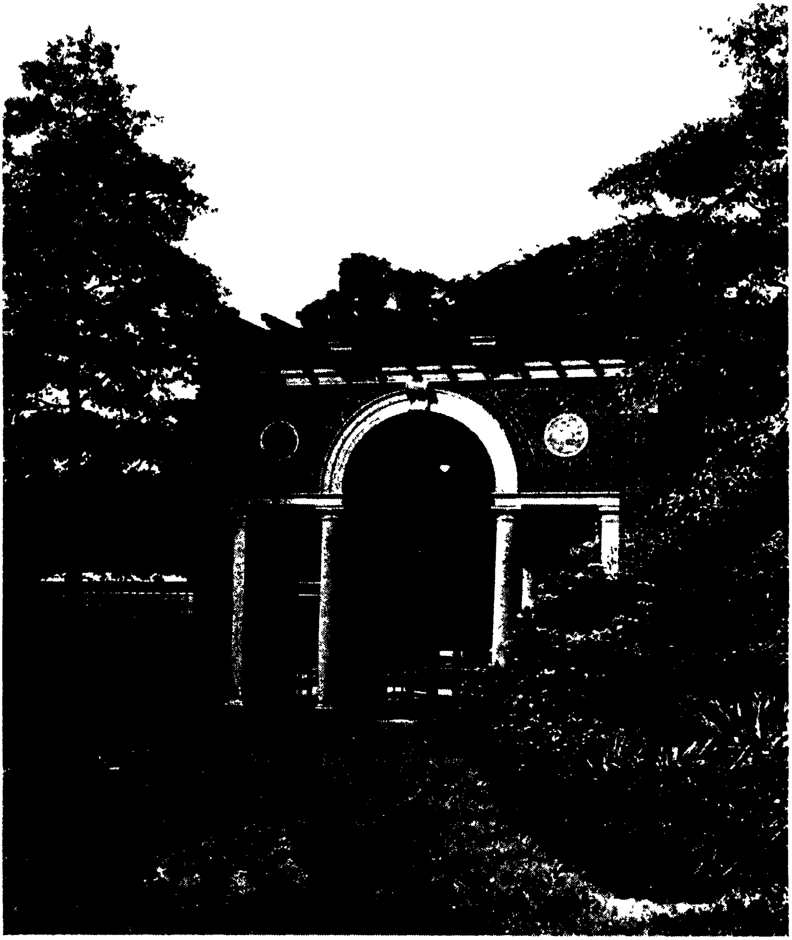

FIG. 35. The Richard Young Gate, May 12, 1937. (9434)

the Hudson River Valley region. Studies of onion smut conditions in the Wallkill Valley of Orange County, and a cereal disease survey through the Hudson River Valley were also made. Later, a new wheat disease caused by nematodes was investigated in West Virginia.

Dr. Orland E. White was granted a leave of absence for several months in 1918 in order to collaborate with the National Research Council in the study of problems connected with the growth and utilization of the castor bean, which had become of great importance for the purpose of securing oil for use as a lubricant for airplanes. Castor bean plantings in several Southern states were visited and studies were carried out on the value of different varieties for the production of oil.

In 1917-1918, a model vegetable garden was exhibited on the grounds of the Botanic Garden, and many plots were devoted to "win-the-war gardens." Members of the Garden staff worked with the Mayor's Committee on Food Supply. Leaflets were prepared, lectures were given to various groups, and gardens in Brooklyn were inspected. In the present war, a similar program of public education on vegetable gardening has been conducted through courses, lectures, demonstrations, leaflets, newspaper articles, and radio broadcasts. One member of the staff has devoted a large amount of time with the Greater New York Victory Garden Council.

Arrangements were made between the Botanical Society of America and the Botanic Garden for the publication of the *American Journal of Botany*. The first volume of the journal appeared in 1914, twenty-two volumes being published through the cooperation of the Society and the Garden. In 1920, a similar arrangement was made with the Ecological Society of America for publishing *Ecology* and, in 1921, with the Editorial Board of *Genetics* for the publication of its journal. Dr. Gager acted as Business Manager for all three journals and, since they are widely circulated in foreign countries, this has been one of the important ways in which the Garden has aided in the advancement of botany.

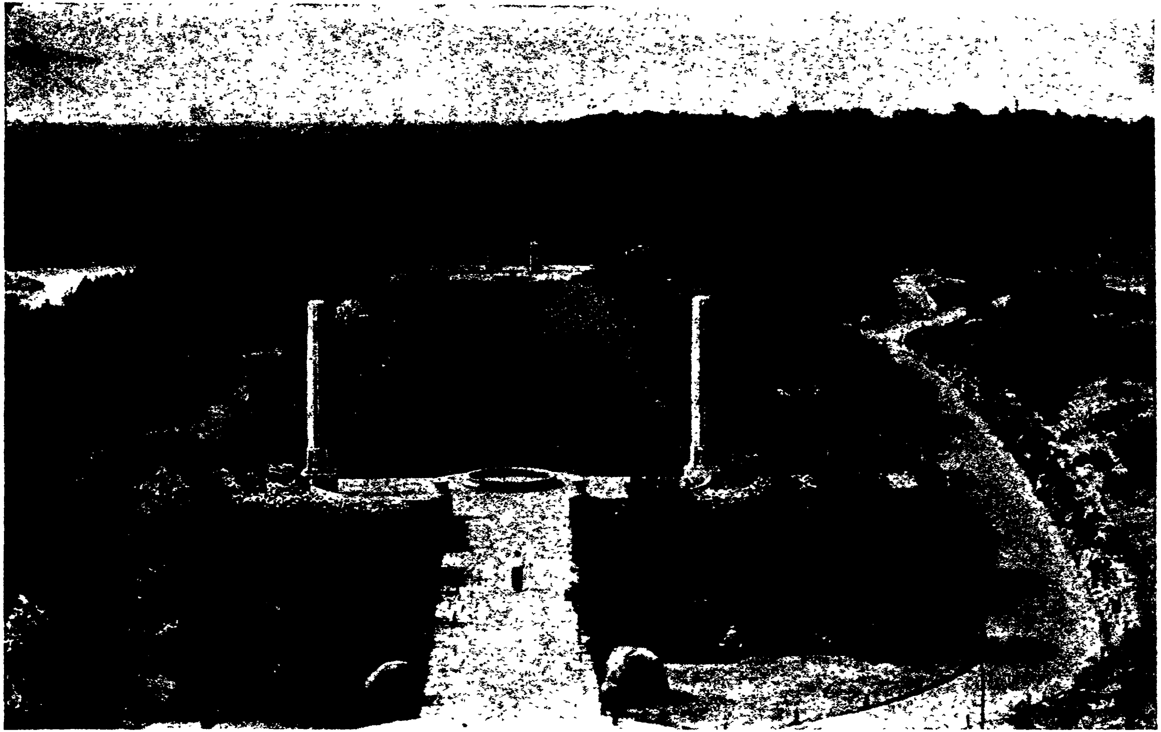

Fig. 36. Osborne Memorial, Horticultural Section. View looking South. June 1, 1940. (10107)

## ENDOWMENTS AND GIFTS

By the terms of the original agreement between the City of New York and the Brooklyn Institute of Arts and Sciences, the former has made annual appropriations for the maintenance of the Botanic Garden, and from time to time special funds for permanent improvements have been supplied. In its relation to the City, the Garden has been affiliated with the Park Department, and the Park Commissioners have given effective support.

The Botanic Garden, however, would not have accomplished its purposes if it had not been aided by large gifts from private individuals. In order to establish the Garden, an endowment fund of $50,000 was offered by friends of the Institute, through Mr. Alfred T. White, in December, 1906. As the years passed by, many contributions for specific endowments have been received, and special funds for particular features also have been given.

At present, there are twenty-two distinct endowment funds, the principal of which amounts to a total of about $1,389,325. Among the larger endowments may be mentioned the Alfred T. White Fund (1921), the Robert B. Woodward Bequest (1921), the Brooklyn Institute Centennial Fund (1924), the Henry W. Healy Trust (1930), the F. E. W. Fund (1937), and the Ellen Eddy Shaw Fund (1939). In 1926, Mr. John D. Rockefeller, Jr. offered $250,000, provided that an equal sum be obtained from other sources before December of that year. Under the chairmanship of Mr. Alexander M. White, the citizens of Brooklyn contributed a total of $256,000, thus fulfilling the terms.

A plan for providing for additional permanent funds was the proposal of Dr. Gager that twenty per cent of the annual income from funds restricted by terms of gifts and otherwise to the educational and scientific work of the Botanic Garden be set aside each year, and the interest compounded. The result of this proposal, which was adopted as of January 1, 1921, has been the building up of the Endowment Increment Fund, which has added more than $150,000 to the permanent funds.

Financial contributions have been secured from many different sources and utilized for specific purposes. Special mention should be made of the research funds. The contribution of $50,000 by Mr. Alfred T. White and friends resulted in the establishment of the Curatorship of Plant Pathology, in 1921, and annually since then additional amounts have been provided for carrying on this phase of the Garden's activities. For special research purposes, the American Academy of Arts and Sciences, The National Research Council, The American Philosophical Society, The American Iris Society, as well as many individuals, have contributed.

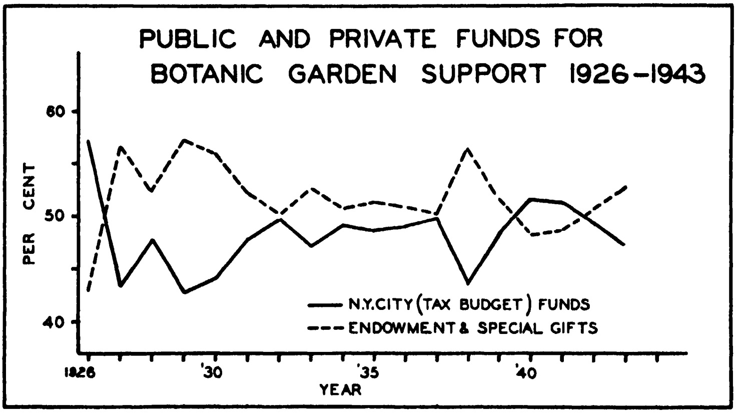

CHART 1. Comparison of Botanic Garden expenditures from public and private sources.

In the course of the years, many gifts have been received. In 1915, Mr. Alfred T. White provided for the construction of the Japanese Garden, and anonymous friends have contributed annually for its upkeep. Mr. White also donated $100,000 for the completion of the Laboratory Building and conservatories in 1916. The construction of the Rose Garden was made possible by contributions of Mr. and Mrs. Walter V. Cranford, and later, the Rose Arc was presented by Mrs. Cranford in memory of her husband. Funds for providing bridges were made available by Mrs. John Hills and Mr. Alfred W. Jenkins; the gate on Flatbush Avenue was presented by Hon. Richard Young in 1929; a bequest of Mr. Sidney Maddock provided funds for the two gates on Washington Avenue in 1937 and 1938. The Osborne Memorial in the Horticultural Section was given by Mrs. Dean C. Osborne in 1938 in memory of her husband.

Other significant gifts are the bronze statue "Roses of Yesterday" for the Rose Garden, by Mrs. Walter V. Cranford, in 1937, and the armillary sphere and fountain on the conservatory plaza by Mr. Alfred W. Jenkins, in 1930 and 1933. Mrs. Glentworth R. Butler secured the funds for drinking fountains. Several donors contributed the garden seats, including Mr. and Mrs. Edward C. Blum, Dr. and Mrs. Charles G. Purdy, Mr. Alfred W. Jenkins, and the Garden Teachers Association. The tablets for the glacial boulders were provided by Mr. Edward C. Blum and the Boys and Girls Club.

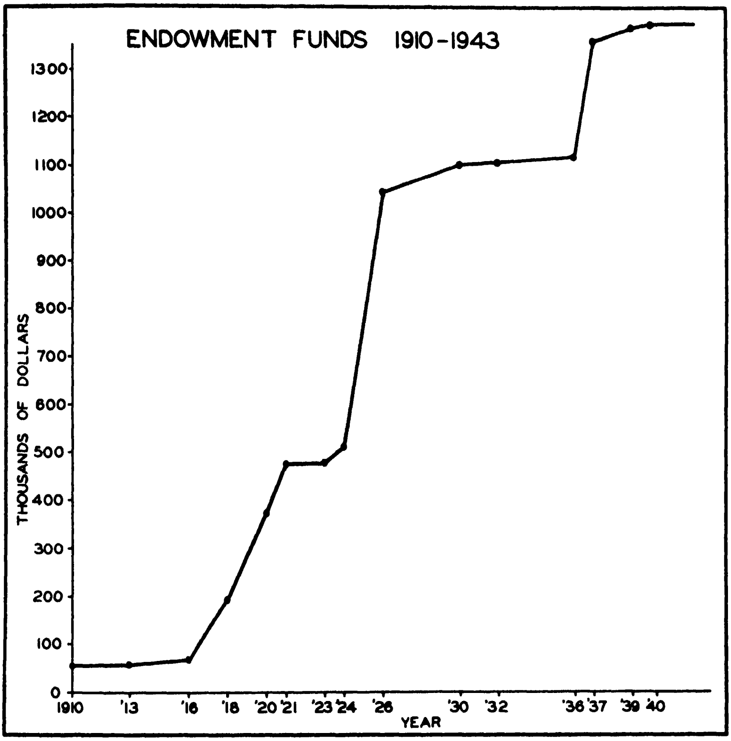

CHART 2. Growth of Botanic Garden permanent resources for scientific and educational purposes.

The National Society of the Daughters of the American Revolution, the Colonial Daughters of the Seventeenth Century, the Brooklyn Civic Council, the Faculty and Students of the Girls

Commercial High School, the Girl Scouts of Flatbush, and others, have endowed trees in the Garden. Mrs. Edward C. Blum made a contribution for a planting of Forsythia.

The Botanic Garden has been fortunate in having the support of many friends. As one of the three divisions of the Institute of Arts and Sciences, it has been under the administration of the Board of Trustees of the Institute. Mr. A. Augustus Healy was President of the Board of Trustees from 1895 until 1920, during the period in which efforts were made to establish a garden, and the first ten years of its development. Mr. Frank L. Babbott was President from 1920 to 1928, and he was followed by Mr. Edward

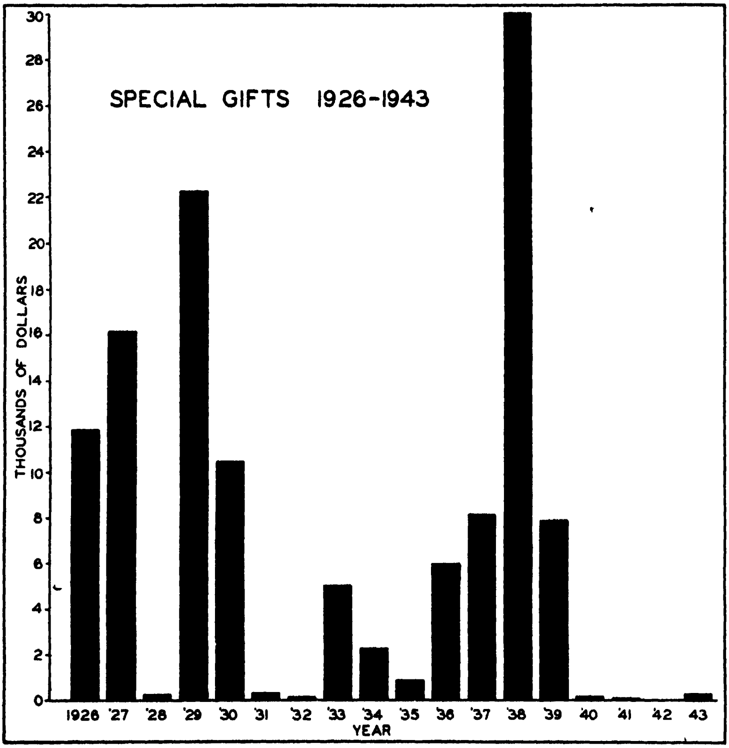

CHART 3. Gifts to the Botanic Garden for special purposes—such as the Maddox and Young entrance gates, the Jenkins and Hills bridges, the Osborne Memorial, the Cranford Rose Garden.

C. Blum, who served as President from 1929 to 1938 and, since then, as Chairman of the Board. From 1939 to 1942 Dr. James G. McDonald was President of the Institute, being succeeded by Mr. Adrian Van Sinderen.

The Botanic Garden Governing Committee of the Board of Trustees is the administrative group concerned with the management of the Garden, and a great debt is owed to the men and women who have served as members of this Committee. Mr. Lowell M. Palmer was appointed Chairman of the Committee when it was first organized in 1897. He was succeeded by Mr. Alfred T. White in 1905, who continued to serve until his death in January, 1921. Mr. White was followed by Mr. Frank Bailey (1921-1926). Miss Hilda Loines has been Chairman of the Committee since 1926, and has taken a large part in the Garden's development.

In 1915, Dr. Gager suggested the organization of a Woman's Auxiliary, which might aid in the development of the Garden and help to articulate it with the local public. The Auxiliary was formed at the home of Mrs. Alfred T. White on March 8, 1917, and has rendered valuable service in many ways. Mrs. H. B. Spelman was the first President and, in the course of the years, the following women have served as President: Miss Hilda Loines (1921-1925), Mrs. Glentworth R. Butler (1926-1932, Honorary President in 1932-1942), Mrs. Charles E. Perkins (1932-1934), Mrs. Irving L. Cabot (1935-1936), Mrs. Henry J. Davenport (1937-1940), and Miss Jessie H. Righter (1941-).

The Woman's Auxiliary has been an integral part of the Garden, and has been effective in raising funds, canvassing for increased membership in the Garden, and has contributed many valuable gifts. Funds were provided for the publication of *Memoir* 4 of the Garden series which contained the papers presented at the Twenty-fifth Anniversary Exercises. A contribution was made for the publication of a colored plate illustrating iris hybrids. The Plaza planting of magnolias, some of the shrubs and trees for the Horticultural Section, and the new planting of Japanese flowering cherries on the Esplanade, were furnished by this organization.

The success of the Annual Spring Inspection, held in May, has depended in large part on the coöperation of the Woman's Auxiliary. The members of this organization have also acted as hostesses on Flower Days, such as Rose Garden Day and Chrysanthemum Day.

In his address given at Swarthmore College on May 23, 1942, on the presentation of the 1941 Arthur Hoyt Scott Garden and Horticultural Award of a Gold Medal, Dr. Gager stated: "If anything has been accomplished at the Brooklyn Botanic Garden during the past thirty-two years worthy of such recognition as this, it is due to the support and encouragement of generous and philanthropic trustees and other citizens and to the loyal coöperation of an able staff, which has made possible the development of an institution after a pattern which, in its entirety, is essentially new for a botanic garden."

## PERSONAL ACTIVITIES, HONORS, AND ACHIEVEMENTS OF THE DIRECTOR

A complete list of the published writings of Dr. Gager would contain more than three hundred titles. Some of these were technical contributions to botany; others were concerned with botanical education; and a very large number were short articles dealing with the Botanic Garden, and book reviews.

Dr. Gager edited the publication of thirty-two annual volumes of the *Brooklyn Botanic Garden Record*, which was founded in 1912. One number of each volume was devoted to the Annual Report of the Garden's activities. Other numbers included the *Prospectus* of courses for the educational work, the publication of special features of the Garden, including the *Guides* to *The Japanese Garden*, *Rock Garden*, *The Story of Our Boulders*, *The Story of Fossil Plants*, *The Rose Garden*, *Local Flora*, *Herb Garden*, and the *Medicinal Plant Garden*. In the Annual Reports of the Director, Dr. Gager reviewed the activities and accomplishments of the Garden. Some of the special numbers were written by him, or with his active coöperation.

In 1908, Dr. Gager published an extensive paper on the effect of radium rays on plants. His interest in the evolution of plants led him to translate and publish, in 1910, *Intracellular Pangenesis*, by Hugo deVries. In 1916, he published his first text book *Fundamentals of Botany*, and in 1926, another text, *General Botany with Special Reference to its Economic Aspects*.

For many years Dr. Gager was engaged in compiling data for the publication of *Botanic Gardens of the World: Materials for a History*. The first edition appeared in 1937 and a second in 1938, in the Botanic Garden *Record*. Data concerning more than 550 botanic gardens in eighty countries were included. Dr. Gager had visited some of these gardens in 1927, when he made an inspection of gardens and botanical institutions in seven countries in Europe. Again, in 1930, when he attended the Ninth International Horticultural Congress in London, and the Fifth International Botanical Congress in Cambridge, he spent some time visiting European botanical gardens.

On many occasions, Dr. Gager was called upon for public addresses. In these, he presented botanical and horticultural information in an interesting way. Some of the most important ones include that on *Botany*, a non-technical address before the students and faculty of the University of Missouri, in 1909; the address of the retiring Vice President and Chairman of Section G, Botany, of the American Association for the Advancement of Science, *The Near Future of Botany in America*, on December 29, 1917; the address at the dedication of the Wellesley botany building, November 1927, *Wellesley College, and the Development of Botanical Education in America;* The Founder's Day address, Swarthmore College, Swarthmore, Pa., *Botanic Gardens in Science and Education*, on October 31, 1936; the address of the retiring President of the Botanical Society of America at Indianapolis, December 29, 1937, on *Pandemic Botany*. His last important address was delivered at Swarthmore College, May 23, 1942, on *Theatres, Gardens, and Horticulture*, at the time of his acceptance of the Arthur Hoyt Scott Horticultural Award and the dedication of the new open-air theatre of the College.

Dr. Gager's breadth of interest was shown by his membership and activities in many botanical, horticultural, and other organizations. He was a member of the following:

American Association for the Advancement of Science;
American Association of Botanic Gardens and Arboretums (Member of the Board of Directors, 1940-);
American Society of Biological Chemists;
American Society of Naturalists;
Botanical Society of America (President 1936);
Fairchild Connecticut Garden (Member of the Board of Trustees and President pro tempore);
Horticultural Society of New York (Member of the Board of Directors, 1928-; Vice-Chairman of the Board, 1938-);
New York Academy of Sciences;
Park Association of New York City;
Society of Experimental Biology and Medicine;
Société Linnéene de Lyon;
Svenska Linné-Sällskapet;

Torrey Botanical Club (President 1942);
Adelphi College (Trustee, 1932-1940);
Brooklyn Civic Council;
Century Association;
Committee of One Hundred for the Completion of the Brooklyn Central Library;
National Institute of Social Sciences (Vice President, 1928-1931; President, 1932-1935, and Vice President, 1935-);
New York City Committee for Public Education;
Twentieth Century Club (President 1933-1935);
Rembrandt Club.

Dr. Gager served on many botanical and horticultural committees, among others, the following:

American Institute of Park Executives to consider affiliation of botanic gardens and arboretums;
Botanical Exhibits for the World's Fair (A Century of Progress), Chicago, 1933;
Education and public relations of Planning Committee on United States Botanic Gardens (Chairman 1934-);
Merchants' Association of New York City (1922-; Chairman 1933-);
Sub-committee on Organization of Editors of Committee on Research Publications, National Research Council (1934);
Plant Quarantines and their Administration;
Sub-committee on Scope and Function of Planning Committee on United States Botanic Gardens (1934);
Sub-committee on Survey of Committee on Effects of Radiation on Living Organisms, National Research Council (1931-1935);
Vice-President of Hortus, Inc., for the New York World's Fair.

Dr. Gager served as Vice President and Chairman of Section G, American Association for the Advancement of Science, in 1917; as President of the Botanical Society of America in 1936; as Vice President of the Torrey Botanical Club in 1917–1931, and President in 1942. He was made an honorary member of the Royal Agricultural and Horticultural Society, India, the School Garden

Association of America, and the Royal New Zealand Institute of Horticulture. The Pennsylvania Horticultural Society made him an honorary life member in 1934. In 1920, the honorary degree of Doctor of Science was conferred on him by Syracuse University, from which he had graduated twenty-five years before. In 1921, the honorary degree of Doctor of Pedagogy was conferred by the New York State College for Teachers.

An honor which Dr. Gager greatly appreciated was the Arthur Hoyt Scott Garden and Horticultural Award of a gold medal and cash for outstanding achievement in the field of horticulture and botany, in 1941.

On the twelfth day of June, 1943, Dr. Gager was at the Brooklyn Botanic Garden for the last time. In July, 1910, when he first saw the original area of forty acres, then known as Institute Park, substantial border mounds had been constructed along Washington and Flatbush Avenues and planted with miscellaneous trees and shrubs. The land had been graded to provide a diversified topography, with a lake and hills, and walks had been laid out. "Such was our inheritance," he wrote.

In contrast, a third of a century later, the Botanic Garden was well established. The grounds were planted with many herbs, shrubs, and trees, arranged in a manner to show their relationship. Many special features had been provided—the Japanese Garden, the Rose Garden, the Local Flora, flowering cherries and crab apples, daffodils, waterlilies, the Children's Gardens, and "my brook," running through the grounds from the lake. The Laboratory Building, with its classrooms, laboratories, library, and administrative offices, provided visible evidence of the accomplishment in the realm of education and research. The Garden had a host of friends whose interest and material support made possible the realization of Dr. Gager's vision of a world-renowned institution of botanical teaching and research, placed in a setting of great beauty. He might well have said "This is our bequest."

If, in reviewing this record of accomplishments at the Brooklyn Botanic Garden, we have also kept in mind, as Dr. Gager admonished us to do in making a review of past accomplishments, that "the present holds the promise of the future," then this record will have its greatest value not only as a memorial to the man whose continuity of effort created the Brooklyn Botanic Garden, but also as a stimulus to those who, by their courage and vision, will carry on the ideals for which he labored, and continue to build for permanence, just as he would have wished it.

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Effects of the rays of radium on plants. Mem. N. Y. Bot. Gard. **4**: 1-278. 1908.

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The influence of radium rays on a few life processes of plants. Pop. Sci. Mo. **74**: 222-232. 1909.

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## ACKNOWLEDGMENT

This account has been prepared by the Botanic Garden staff, with the assistance of Marie E. Conklin.

## THE THIRTIETH ANNUAL SPRING INSPECTION

## TUESDAY, MAY 9, 1944

The program was planned in honor of Dr. C. Stuart Gager, Director, July 1, 1910-August 9, 1943. It included an assembly in the Auditorium, a tour of inspection of the grounds to view interesting features of the Garden, and an exhibit, displayed in the rotunda, corridors, and exhibit room, of enlarged photographs of the Garden illustrating its development.

Miss Hilda Loines, Chairman of the Governing Committee, presided at the meeting in the Auditorium, and introduced Mr. John C. Wister as follows:

"In welcoming you this afternoon it seems strange not to have with us Dr. Gager, who was always the centre of these occasions, and it is still stranger to realize that before Dr. Gager came to Brooklyn there was no Brooklyn Botanic Garden here. It was he who developed an unpromising area consisting chiefly of wasteland into this place of beauty which we are all enjoying today. But in the development of the Brooklyn Botanic Garden, Dr. Gager's service to science and education was no less notable, and I should like to give you an estimate of his work in this field by the noted Russian botanist, Dr. N. W. Timofeeff-Ressovsky, who came to this country for the Genetics Congress of 1932. After a visit to the Brooklyn Botanic Garden, he wrote as follows:

" 'The Brooklyn Botanic Garden is a very young one; and it is astonishing to realize in how short a time Dr. Gager has succeeded in organizing such a rich and well-planned scientific and public institution. In many respects the best European botanical gardens are far behind the Brooklyn Botanic Garden, although they are much older, and have a long scientific and organizational tradition and connections with celebrated old universities and scientific institutions.

" 'The second point concerns the research work that Dr. Gager and Dr. Reed have organized at the Brooklyn Botanic Garden. In most cases research is the weakest aspect of botanical gardens. In cases where some connection with science exists, it is usually only a connection with systematics. Very seldom does one see experimental research done in botanical gardens, in spite of the fact that they must offer especially good conditions and possibilities for this kind of modern scientific work. Therefore I consider it particularly significant that Dr. Gager has emphasized the importance of experimental scientific work and has found some financial support for this work, that he has published (in excellent editions) the results of the work, and that in addition he has provided opportunities for young scientists from the New York universities to do their experimental work on the research grounds of his Garden.

" 'The last point, and perhaps the most impressive, is the organization of the pedagogical department of the Brooklyn Botanic Garden. I think that in this respect the Garden surely occupies one of the first places, if not the first, in the whole world. Especially well planned and well organized are the rooms, greenhouses and gardens for children of different ages, and the collections of lantern slides, accompanied by short abstracts of papers to be read by teachers.'

"It was the happy suggestion of Dr. Reed that the Spring Inspection this year be made the occasion to honor the achievements of Dr. Gager, and we are especially fortunate in having with us as our speaker, Mr. John C. Wister, Director of the Arthur Hoyt Scott Horticultural Foundation, who knew Dr. Gager intimately over a long period of years, and who is eminently qualified to speak of his life and work."

## ADDRESS OF APPRECIATION

BY

MR. JOHN C. WISTER

It is quite fitting that the Spring Inspection, which is the most important of the meetings during the year, should be devoted in part to a tribute to Dr. Gager and to his work, not only in building up the Brooklyn Botanic Garden but in botany and horticulture in general.

Naturally I feel greatly honored to have been asked to speak here today. I first knew Dr. Gager about 1920 and was quickly impressed by the extraordinary breadth of his interests and his deep knowledge of all subjects relating to botany and the growing of plants. I may add something else that will not surprise any of you because I am sure it has happened to you too:—I grew very fond of him and came to value him not merely as a learned man but as a true friend. In the past twenty-four years I have come many times to this garden on many different errands, but hardly ever came without seeing him and without getting from him both help and inspiration.

Many of you know that in the late 90's and early 1900's there arose in Brooklyn a desire for a botanic garden. In time this desire grew into a definite movement which reached fruition in 1910, largely through the active support of Mr. Alfred T. White.

The site chosen for the garden was a thirty-nine acre tract of mostly undeveloped land on part of which the Park Department burned trash and rubbish. Eleven additional acres were acquired later.

Dr. Gager had been, among other things, Professor of Botany at the University of Missouri, and Director of the Laboratories of the New York Botanical Garden, where he had instituted one of the earliest investigations of the effect of radium on plants. In both positions he had made a good impression. Even at an early age his great scientific knowledge made it possible for him to speak to scholars. He had with that the ability to make public addresses which interested his audiences, which frequently, was not the case with many botanists. The unfortunate inability of many scientific men to make the general public understand what they were doing, has held back the appreciation of botany and other sciences for a long time in this country. Dr. Gager helped bring happier cooperation between the scientific botanist, the skillful horticulturist, and the large public that cares for gardening only in a very mild way.

Dr. Gager came to Brooklyn on July 1, 1910. First he had a small office down town. Later he moved to the Brooklyn Museum, for the Botanic Garden was chartered as a subdivision of the Brooklyn Institute of Arts and Sciences. The development work in the garden began in April, 1911. The public was admitted in May 1911 when there was little to be seen in the way of accomplishment except a few paths and trees. In September, 1913, the first part of this building was opened for use and Dr. Gager and staff moved in, although the building and conservatories were not completed until 1917.

I give this brief introduction as a background against which to sketch the work of Dr. Gager, which I should like to consider under four different headings.

1. Development of the Garden.
2. Popular Education.
3. The Promotion of Research.
4. Coöperation with Botanical and Horticultural Organizations.

(1) *Development of the Garden.* Many of us who love trees, shrubs, and flowers, wish to have them displayed in crowded cities for the inspiration and pleasure of the public. It is quite natural that, to us, Dr. Gager's work in building up, on a piece of undeveloped land, this beautiful 50 acre garden, should come first. He, of course, had the benefit of the experience that had been gained in the pioneer gardens of the country. It was early evident, however, that he brought here a new point of view. This was the desire to make the gardens popular with the general public and to have the plants seen by many thousands of people rather than by just a handful of students.

Most of the botanical gardens in the old world were very small. They were primarily for the advanced student. The plants of the various botanical families were crowded closely together so that they might be studied together. The beauty of plants did not seem important to the directors.

Professor Sargent was perhaps the first to develop a public garden along natural lines for beauty as well as study, but even he paid scant attention to plants for the enjoyment of the general public. He was bringing together every woody plant that would stand the New England climate. It was enough for his purpose that one specimen of a species was present. Dr. Gager understood, more than any botanist before him, the need of interesting the general public in botany. He drew attention to his idea that if the sciences are to advance it can only be through popular support. Popular support in botany he believed could best come because people enjoyed visiting the garden and seeing the beautiful plants well grown, in well arranged groups.

He was one of the first to give a section of a public garden to the local flora. He planted in this area as many as possible of the plants of Long Island and nearby mainland. When the greenhouses were built he took care to have some of them filled with beautiful plants for the public to enjoy, in addition to those houses which were used for research. Through the years he developed the different plantations which now form such an important part of the garden: the flowering cherry, the crab apple and lilac collections; the water gardens, the Japanese garden, the rock garden, and finally the magnificent rose garden. Always he insisted on having the plants well grown. Other botanical garden directors do this today but they did not twenty or thirty years ago.

The result has been that Brooklyn people come to this garden in tremendous numbers winter and summer to a total of over a million a year. Many people have gained inspiration for life work in botany or horticulture, because they first saw beautiful plants here. I hope persons inspecting the grounds today will remember that Dr. Gager believed, not only that this botanical garden should do useful scientific work, but that it should be a place where people could find repose from the crowded city. He believed very strongly that the future of botany depended upon interesting more people in botany through the beauty of the growing plants spread out before them at all seasons of the year.

(2) *Popular Education.* Dr. Gager was preëminently an educator. His greatest success was in the dissemination of botanical knowledge. In 1912 Dr. E. W. Olive became Curator of Public Instruction. In 1913 Miss Ellen Eddy Shaw was appointed Instructor of Elementary Education. In 1916 she was appointed Curator and at that time this phase of education was definitely separated from public instruction. Miss Shaw has done much to interest the tens of thousands of children who for nearly thirty years have been coming here for various kinds of instruction. As far as I have any record this was the first time that a botanic garden gave elementary instruction to children. In addition to ordinary teaching there was practice in planting seeds and in developing small garden plots, each one of which belonged to a particular child for the year. This does not seem particularly unusual today because it has become a popular thing all over this great land, but Dr. Gager was one of the first, if not the first, to recognize the value of such instruction.

(3) *The Promotion of Research.* The work of a Director of a great garden leaves little time for extensive research work. Therefore it is not surprising that Dr. Gager himself did not contribute greatly to the advance of science along some particular line after he became Director. He wrote a good deal it is true, and many of his writings are of great value. One report that I remember particularly dealt with the botanic gardens of the world, giving the information as to where each one was, when it was founded, how many acres it covered, who the directors had been and were, and what work it primarily stressed. The thing that seems to me important is that Dr. Gager realized the importance of research, and that he facilitated the researches of others. I remember a famous college president who was interested in History, Government and Economics who during his term built up splendid staffs and courses in these fields, while neglecting the Fine Arts and the sciences. It seems to me that Dr. Gager was the exact opposite because he did not neglect any of the fields in which a botanical garden might function, and he was thoroughly sympathetic in building up departments which did not lie within the range of his own particular interests. It is also characteristic of him that he did not in any way "drive" his curators but rather

that he developed a different relationship with them than is the case between the head and the subordinates in many other institutions. He depended on his curators to carry out their assignments and accepted suggestions or modifications of plans from time to time.

Research was the primary feature of the departments of plant breeding and of pathology. Many investigations were conducted in the taxonomy of certain groups of plants and these investigations included exploratory trips made to various parts of the United State, to Cuba, to Puerto Rico and other parts of the world. There were studies in flower structures, in genetics, in disease resistance, etc. The work in these fields shows again the broadness of his vision and of his sympathy in research in many widely differing problems.

(4) *Coöperation with Botanical and Horticultural Organizations.* Botanical gardens have for a long time exchanged seeds, rare plants and herbarium specimens. It has been the custom for an institution to send one of its curators to visit other institutions to lecture or to study. I have no personal knowledge of how many different botanical gardens Dr. Gager and his curators may have visited in the past quarter century or to how many botanical societies they may have belonged. Dr. Gager had been president of both the Botanical Society of America and of the Torrey Botanical Club, and Vice-President and Chairman of the Botanical Section of the American Association for the Advancement of Science. He had been a member of the Botanical Committee of both the Chicago and the New York Worlds Fairs and and a member of several committees of the National Research Council, and of other important organizations too numerous to mention.

I do have personal knowledge of the coöperation which Dr. Gager gave to various horticultural societies, and I wish to go into more detail about this because I know of no other institution which has done so much in this field.

I first met Dr. Gager because when I was the very new president of the very new American Iris Society I came to Brooklyn to ask his help in establishing a test garden for Japanese Irises. Dr. Gager was most cordial and encouraging to me. He authorized the project. A collection of Japanese Irises was established.

Nomenclature was studied; color classifications were worked out; soil, fertilizer and moisture requirements were studied in detail. Dr. Reed even made a trip to Japan to get first hand knowledge. Miss Maud H. Purdy and Miss Louise B. Mansfield made water color drawings which are the authoritative record of the recognized varieties.

Dr. Gager was willing to coöperate with a small new society which had not proved its worth. He made it possible for that society to publish the first authoritative information about this beautiful and often difficult group of Irises. I think in contrast of a prominent engineer whom I have known over thirty years. His work for many civic projects both in his own state and in the nation at large have brought him public respect. My respect for him, however, was almost entirely destroyed, because I learned that some years ago when he was asked to help in a worthy public work, he declined because the organization involved was new and had not yet proved its ability. He did not know whether it could succeed. He said that he personally could not afford to be associated with any failure. This narrow and selfish point of view, is one shared by many otherwise fine people. It certainly was not the point of view of Dr. Gager. He never took time to think whether a new organization would succeed or fail, or whether failure in something with which he coöperated would reflect on him personally. All he thought of was to help. What he did for the American Iris Society he did with many other similar horticultural societies. I mention it in detail because it was my first experience with him and with the Brooklyn Botanic Garden.

Dr. Gager was a Director of the Horticultural Society of New York from 1928 to 1943, and a Vice-President from 1937 to 1943. His wise, kindly, guiding hand could be seen in much of the work of that society. In its great flower shows, the Brooklyn Botanic Garden staged some of the most effective educational exhibits. Perhaps the finest of these was the demonstration of the propagation of plants by various methods. There were shown the seeds, the resulting young seedlings a few days and then a few weeks old, then finally a few months or a few years old. There were cuttings, rooted cuttings, young plants after they had been grown some months or years. There were cions, grafts and grafted plants, buds and budded plants, all in the various stages of their growth. Not only were the entire plants shown but plants were split and cut so that the union between the cion and the stock was demonstarted in cross section.

It seems to me that one of Dr. Gager's most important undertakings was his work in connection with the organization of The American Association of Botanical Gardens and Arboretums. This association, by building more effective coöperation between existing botanic gardens and encouraging the establishment of new ones in cities and towns which do not now have them, may carry out on a national scale Dr. Gager's belief in the importance of interesting the public if botanical science is to continue to progress. He saw, before many others did, that the day of the privately endowed institution is coming to a close. If the botanical institutions are to continue under private management rather than be government sponsored and subject to political influence, then great numbers of people must become interested enough to demand this.

At Cleveland where the new association was born, Dr. Gager became a trustee, which position he held until his death. He made one of the most important addresses and inspired the entire meeting. He had that wonderful quality of carrying his audiences with him.

It was not the first time that I had seen him do this. Just as he had helped me when the American Iris Society was new, he helped me again by coming to Swarthmore College when the Scott Horticultural Foundation was quite new. Before a great audience gathered on Founders Day he outlined the relationship of botany, the knowledge and love of plants, and of gardening, to other phases of education. He did it so happily and with so much humor that the President of the College and the professors as well as students came away with a totally new point of view about the importance of the planting of trees, shrubs and flowers on the college campus. This ability to tell about plant life in a way to interest all kinds of people, young and old, was one of Dr. Gager's greatest gifts.

I do not wish to give the impression that I believe everything that has been accomplished here in Brooklyn was done by Dr. Gager alone. No one person could have brought this institution in this comparatively small number of years to its present condition.

Over the Director there was the governing committee headed for more than ten years by Mr. Alfred T. White, then for a shorter term by Mr. Frank Bailey, and for the last 18 years by Miss Hilda Loines who is presiding at this meeting today. He had the help of this committee, the help of the trustees of the Institute, the help of the Woman's Auxiliary. He had the devotion of the members of the staff and of all the workers of the Garden.

I should like to quote from what Dr. Wm. J. Robbins of the New York Botanical Garden wrote of him: "Few men have been able to combine, as Dr. Gager did, horticulture and botany, education and research, the applied and the scientific, civic interests and professional duties. A man of the highest ideals, Dr. Gager did not hesitate to oppose attitudes, ideas or trends which he considered unwise or ill considered or to correct errors in fact or statement in the fields with which he was familiar. Yet no worthy project related to his fields of interest failed to receive quick and generous support. His career illustrates how much can be done by a man of ability who devotes himself consistently and conscientiously to a subject he considers worthy of his utmost effort."

I have tried to tell you some of the things I have known about Dr. Gager. When I first came here it was as a stranger for technical horticultural help, but as I continued to come here particularly in the later years, I came to look upon him as a friend with whom I could talk over many personal problems, and I often came very much more for such personal advice than for the direct business of the garden. Generous, kindly, humorous and tolerant he was a friend I shall remember as long as I live. It seems to me that the quotation, from Wordsworth, which he had inscribed over the entrance to the Children's Garden House, is peculiarly fitting to Dr. Gager:

"He is happiest who hath power
To gather wisdom from a flower."

# THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

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**THE MUSEUM** offers its members private views of exhibitions, admission to Museum courses, phonograph records and prints from its lending libraries, and docent services. Also: five Museum publications free of charge and other Museum publications at reduced prices.

SIDNEY W. DAVIDSON, *Chairman, Governing Committee.*
MRS. LAURANCE P. ROBERTS, *Director.* ALBERT N. HENRICKSEN, *Assistant Director.*

**THE BROOKLYN ACADEMY OF MUSIC** is owned and operated by the Brooklyn Institute. Its Opera House, Music Hall, and Ballroom may be rented for concerts, plays, lectures, school ceremonies, dances, and other events.

WILLIAM T. HUNTER, *Chairman, Building Committee.* HERBERT T. SWIN, *Building Superintendent.*

# PRIVILEGES OF MEMBERSHIP
# IN THE
# BROOKLYN BOTANIC GARDEN

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The Brooklyn Botanic Garden renders a public service in its endeavor to advance a knowledge of plants, affording educational advantages, and carrying on fundamental investigations. Members of the Garden have the opportunity of furthering these aims.

Special membership privileges are also offered as follows:

1. Advice on the choice and care of ornamental trees, shrubs, and herbaceous plants, and the best ways to grow plants successfully, involving methods of culture, and control of insect and fungous pests.
2. The naming of botanical specimens submitted for determination.
3. Periodical distribution of surplus ornamental plant material and seeds.
4. Invitations for self and friends to the Annual Spring Inspection, and to spring and fall "Flower Days"; cards of admission to all exhibitions and openings preceding the admission of the general public, and to receptions; admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Services of a guide (by appointment) for self and party, when visiting the Garden.
6. Free tuition in all courses of instruction, except that in greenhouse and laboratory courses a small fee is charged to cover cost of materials, etc.
7. The Library and Herbarium are available for consultation.
8. Announcement cards concerning plants in bloom and the activities of the Garden are sent to members from time to time.
9. As part of its services, the Brooklyn Botanic Garden issues publications of general horticultural interest, and technical papers based upon the researches carried on at the Garden. Special *Guides* to the plantations and collections, *Leaflets* of popular information, and the quarterly *Record,* which includes the *Annual Report* of the Garden's activities, are sent free to members.
10. Membership privileges in other botanic gardens and museums outside of Greater New York are offered to our members when they are visiting other cities and on presentation of Brooklyn Botanic Garden membership card.

## CLUB MEMBERSHIPS

For many years the Botanic Garden has had the pleasure of cooperating in numerous ways with Garden Clubs, Women's Clubs, and other organizations of the Metropolitan area, and a plan has been adopted whereby such organizations may become definitely identified with the work of the Garden in promoting an interest in plant life and horticulture, as follows:

*Annual Memberships.*—Garden Clubs or other organizations may qualify as Annual Members of the Garden on election by the Board of Trustees and payment of the annual membership fee of Ten Dollars. Each annual member club may designate one of its officers or other member to receive such invitations, notices, and publications as go to individual annual members and to represent the club at all Botanic Garden functions, including "Flower Days" and the annual Spring Inspection in May.

The Club may also have the following privileges:

*a. The services of a Botanic Garden docent or guide* for a tour of the plantations or conservatories, followed by tea. No parties of less than ten adults will be conducted. Schedule for such events must be arranged in advance, at dates mutually convenient to the Botanic Garden and the Club.

*b. One lecture a year* by a member of the Garden staff. This may be either (1) a lecture given to the Garden Club at the Botanic Garden or (2) a lecture given at a place specified by the Garden Club. A list of speakers and subjects available in these two categories will be mailed on request.

Arrangements will be facilitated if the Club will, with each request, designate at least two names.

*c.* One member of the club is entitled annually to free tuition in courses of instruction for which tuition is charged to nonmembers. In greenhouse and laboratory courses a nominal fee is charged to cover cost of material.

*Sustaining Memberships.*—Any club or other organization may become a Sustaining Member of the Garden on election by the Board of Trustees and annual payment to the Garden of the sustaining membership fee of Twenty-five Dollars.

Sustaining membership clubs enjoy the full privileges of annual membership, not only in the Botanic Garden but also in the Brooklyn Museum and The Institute at the Academy of Music. They may designate three members who may receive free tuition in Botanic Garden courses of instruction for which tuition is charged to non-members. They are entitled each year to two lectures free, by a lecturer chosen from the Garden's list of lecturers.

## OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
Berkshire Museum, Springfield, Mass.
Boston Society of Natural History, Boston, Mass.
Buffalo Museum of Science, Buffalo, N. Y.
California Academy of Sciences, San Francisco, Calif.
Carnegie Museum, Pittsburgh, Pa.
Charleston Museum, Charleston, S. C.
Chicago Natural History Museum, Chicago, Ill.
Cranbrook Institute of Science, Bloomfield Hills, Mich.
Everhart Museum of Natural History, Science and Art, Scranton, Pa.
Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
Los Angeles Museum, Los Angeles, Calif.
Massachusetts Horticultural Society, Boston, Mass.
Missouri Botanical Garden, St. Louis, Mo.
Newark Museum, Newark, N. J.
New York State Museum, Albany, N. Y.
Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
Pennsylvania Horticultural Society, Philadelphia, Pa.
Philadelphia Commercial Museum, Philadelphia, Pa.
Southwest Museum, Los Angeles, Calif.

## CLASSES OF MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following eight classes of membership may be taken out through the Botanic Garden:

| | |
|---|---|
| 1. Annual, by annual payment of ....... | $ 10 |
| 2. Sustaining, by annual payment of .... | 25 |
| 3. Contributing, by annual payment of .. | 100 |
| 4. Life, by one payment of ............. | 500 |
| 5. Permanent, by one payment of ....... | 2,500 |
| 6. Donor, by one payment of ........... | 10,000 |
| 7. Patron, by one payment of .......... | 25,000 |
| 8. Benefactor, by one payment of ....... | 100,000 |

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to eight carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members also enjoy the special privileges indicated on a preceding page.

Further information concerning membership may be had by addressing the Director, Brooklyn Botanic Garden, Brooklyn 25, N. Y., or by personal conference by appointment. Telephone, MAin 2-4433.

NOTE: *Contributions to the Brooklyn Botanic Garden, through membership dues or otherwise, constitute proper deductions under the Federal and New York State Income Tax Laws.*

# FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

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### Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which said sum to be used exclusively for the educational and scientific work of the Brooklyn Botanic Garden.

### Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

### Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which sum to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as the ..............................................fellowship.

### Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *

..............................................................................

..............................................................................

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* The following additional purposes are suggested for which endowment is needed:

1. Botanical research.
2. Publishing the results of botanical research.
3. The endowment of special gardens and collections.
4. The Library.
5. The Herbarium.
6. Extending and enriching our work of public education.
7. The purchase and collecting of plants.
8. Popular botanical publication.
9. Illustrations for publications and lectures.
10. The beautifying of the grounds.

## THE BOTANIC GARDEN AND THE CITY

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THE BROOKLYN BOTANIC GARDEN, established in 1910, is a Department of the Brooklyn Institute of Arts and Sciences. It is supported in part by municipal appropriations, and in part by private funds, including income from endowment, membership dues, and special contributions. Its articulation with the City is through the Department of Parks.

The City owns the land devoted to Garden purposes, builds, lights, and heats the buildings, and keeps them in repair, and includes in its annual tax budget an appropriation for other items of maintenance. One third of the cost of the present buildings (total cost, about $300,000), and other permanent improvements to a total of more than $281,000, has been met from private funds.

Appointments to all positions are made by the director of the Garden, with the approval of the Botanic Garden Governing Committee, and all authorized expenditures for maintenance are made in the name of the private organization, from funds advanced by the Institute, which, in turn, is reimbursed from time to time by the City, within the limits, and according to the terms of the annual Tax Budget appropriation. Certain salaries are paid, in whole or in part, from private funds.

All plants have been purchased with private funds since the Garden was established. In addition to this, it has been the practice of the Garden, from its beginning, to purchase with private funds all publications for the library, all specimens for the herbarium, all lantern slides and photographic material, and numerous other items. These collections, available without charge for public use, are the property of the Trustees.

The interest on One Million Dollars at the rate of 3.5 per cent, added to the present private funds income, would restore that income to the 1930 figure. The Director will be glad to give full information as to the uses for which such additional income is needed.

# REGULATIONS CONCERNING PHOTOGRAPHING, PAINTING, AND SKETCHING

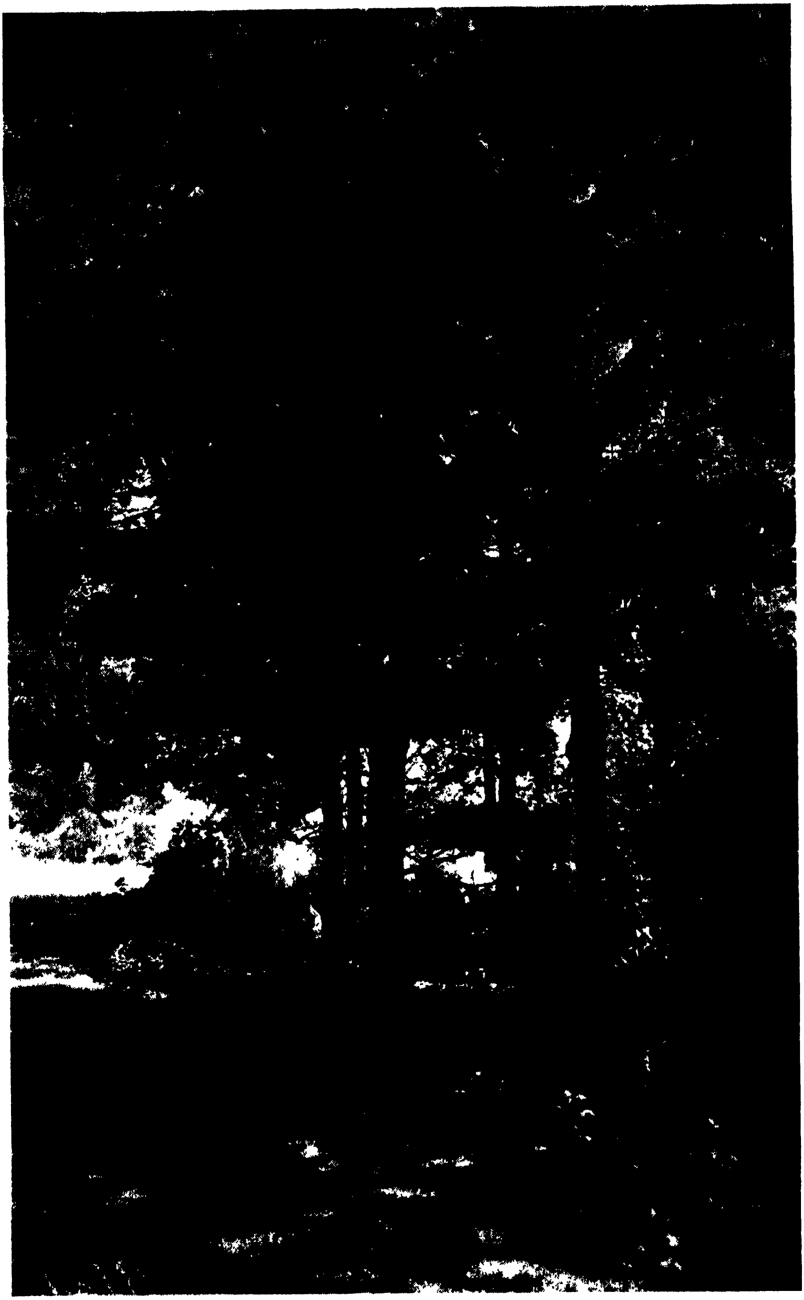
1. No permit is required for photographing with a hand camera, or for sketching or painting without an easel on the Grounds or in the Conservatories.

2. Sketching and painting with an easel and the use of a camera with tripod are not allowed in the Oriental Garden, the Rose Garden, the Local Flora Section (Native Wild Flower Garden), nor the Conservatories at any time without a permit. No permits are given for use after 12 o'clock noon on Sundays and holidays.

3. Artists may not bring into the Botanic Garden chairs, stools, or anything to sit in or on.

4. Holders of permits must not set up tripod cameras nor easels in such a way as to involve injury to living plants or lawns, nor to cause an obstruction to traffic on paths or walks.

5. Application for permits should be made at the office of the Director, Laboratory Building, Room 302, or by mail (1000 Washington Avenue, Brooklyn 25), or by telephone (MAin 2–4433).



View in the Wild Flower Garden, along the brook. (9121)

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXXIII JULY, 1944 NO. 3

# PROSPECTUS: 1944–1945

## COURSES OF INSTRUCTION

Courses for adults and children are classified as follows:

For members and the general public ("A" courses, p. 180)
For teachers ("B" courses, p. 186)
For children ("C" courses, p. 188)
For special groups ("D" courses, p. 188)
Investigation ("E" courses, p. 189)

*Any course may be withdrawn if less than ten persons apply for registration.*

**Registration.**—Because of the limited space available in the instructional greenhouses, and for other reasons, the number of persons that can be registered in many of the courses must be limited. Those who desire to attend any course are urged to send in their applications, with entrance fees, to the Secretary, Brooklyn Botanic Garden, several days in advance of the first meeting. This avoids delay at the beginning of the first session, ensures a place in the course, and enables the instructor to provide adequate material for the class.

Persons are requested not to register in any course unless they are reasonably confident that they can attend the sessions regularly and throughout. This is especially important where the number is limited; for it is obvious that those who register and do not attend may deprive someone else of the privilege of attending.

**Greenhouse Courses.**—Because of limited space in the greenhouses it has become necessary to make the ruling that no person shall take more than two spring greenhouse courses in any one year.

## A. Courses for Members and the General Public

Although these courses are designed primarily for Members of the Botanic Garden, they are open (unless otherwise specified) to any one who has a general interest in plants. Teachers are welcome. Starred courses (*) are open also, for credit, to students of Long Island University, and are described in the current Long Island University catalog. In harmony with an agreement entered into in the spring of 1935, the Botanic Garden, upon recommendation of the Chairman of the Biology Department of Long Island University, offers a course scholarship to one student of the University. A similar arrangement has been made with Brooklyn College. (Cf. p. 186.)

### FALL

**A1. House Plants.**—*Five Wednesdays, 10:30 a.m., November 1 to 29.* House plants for decoration and interest. How to make them thrive. Raising new plants, which become the property of class members. Instruction in potting, making cuttings, mixing soils, etc. On account of limited space in the greenhouses, this class must be limited to 50 persons. Registration according to the order of application. *Fee to non-members, $5 (including greenhouse fee); to members, $3 greenhouse fee.* Mr. Free.

**A4. Your Garden This Fall.**—*Five Mondays, 10:30 a.m., October 2 to 30.* Getting ready for next year's garden. Soil improvement by means of cover crops; fall planting for early vegetables; pruning; propagating; planting useful and ornamental trees and shrubs; dormant spraying; winter protection. *No fee.* Mr. Free.

***A5. Trees and Shrubs in Winter.**—*Ten Saturdays, 2:30 p.m., September 30 to December 2.* Outdoor lessons, in the Botanic Garden and in the parks and woodlands of Greater New York, on the characteristics of our common trees and shrubs, both native and cultivated, emphasizing their distinguishing features in the winter condition. The habits, requirements as to soil, etc., and the use of various species in landscape art are also discussed. *Fee to non-members, $3.* The first session will be held at the Brooklyn Botanic Garden. Dr. Graves.

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* All starred courses are open for university or college credit to students of Long Island University and Brooklyn College. See above, and p. 186.

**A6. Trees in Prospect Park.**—*Eight Tuesdays, 11 a.m. to 12:30, September 19 to November 14 (omitting November 7).* Outdoor meetings to study the trees of Prospect Park. American and Old World trees will be considered, and particular attention given to large trees. *Fee to non-members, $2.50.* Mr. Doney.

**A7. Relations of Plants to Mankind.**—*Five Mondays, 11 a.m., November 6 to December 4. No fee.*

| | | |
|---|---|---|
| November 6. | First Principles: Plant Products and How they are Formed. | Miss Rusk. |
| November 13. | Plants and People. | Mr. Free. |
| November 20. | The World's Cereal Crops. | Dr. Reed. |
| November 27. | The Pineapple Industry. | Dr. Cheney. |
| December 4. | The Breeding of Trees. | Dr. Graves. |

**A13. Fall Wild Flowers and Ferns: Field Course.**—*Six Saturdays, 2:30 p.m., September 16 to October 21.* Trips in the Botanic Garden and in the woodlands near the City, to learn to recognize the fall-blooming plants of woods and road-sides, and the fruits of wild plants. First meeting at the Botanic Garden. *Fee to non-members, $2.* Miss Rusk.

**A15. Native Ferns in the Botanic Garden.**—*Four Mondays, 6 to 7 p.m., September 11 to October 2.* Meetings in the Wild Flower Garden of the Brooklyn Botanic Garden, where about twenty-five kinds of our native ferns are growing. Sure and easy ways of knowing these ferns are pointed out. No rough walking. (Spring course A16, page 184, is similar.) *Fee to non-members, $1.* Miss Rusk.

***A18. Wild Flowers and Ferns: Field and Laboratory Study.**—*Thirty Thursdays, beginning September 21.* Section 1, *10:30 a.m. to 12:30;* section 2, *4:30 to 6:30 p.m.* A series of two-hour sessions for those who wish to become better acquainted with wild flowers. Field and laboratory work are distributed according to the weather, the season, and the needs of the class. The field

* See pp. 180, 186.

work is done in the Brooklyn Botanic Garden. In the laboratory, plants are studied for flower structure and family relationships, compared and identified, and mounted as permanent specimens. Fresh plants are pressed during the growing season; dried and preserved plants are used in the winter. *Fee to non-members, $8 (including laboratory fee); to members, $3 laboratory fee.*

Miss Rusk.

***A31. Ornamental Shrubs: Fall Course.**—*Six Wednesdays, 11 a.m., September 20 to October 25.* Outdoor sessions in the Botanic Garden, to study the common species and varieties of cultivated shrubs, emphasizing those desirable for planting on the home grounds. Fall flowers and fruits of ornamental shrubs and small trees, also evergreen shrubs, are considered. This is a continuation of the spring course, A30. *Fee to non-members, $2.*

Mr. Doney.

### WINTER

**A22. The World's Food-producing Plants.**—*Five Mondays, 3 p.m., January 8 to February 5.* Non-technical talks, illustrated with lantern slides and specimens; followed by tours in the conservatories of the Botanic Garden, where many of the tropical plants are growing. *Fee to non-members, $1.*

1. January 8. American Plants. Corn, potato, tomato, squash, peanut, pineapple, cherimoya, papaya, etc.
   Dr. Graves and Miss Rusk.
2. January 15. Plants of the Far East and Africa. Rice, soybean, coconut, sugar, breadfruit, orange, banana, mango, etc. Dr. Gundersen and Miss Clarke.
3. January 22. Plants of Western Asia and Europe. Cereals, olive, date, fig, pomegranate, cabbage, carrot, peas, etc. Dr. Gundersen and Miss Clarke.
4. January 29. Beverage Plants. Chocolate, coffee, tea, maté, etc. Dr. Graves and Miss Rusk.
5. February 5. Spices and Food Adjuncts. Cinnamon, vanilla, pepper, ginger, etc. Dr. Graves and Miss Rusk.

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* See pp. 180, 186.

## SPRING

**A3. Herbs: How to Grow and Use Them.**—*Six Tuesdays, 10:30 a.m., March 6 to April 10.* Lectures and practical work in the greenhouses. Plants raised become the property of class members. *Fee to non-members, $5 (including greenhouse fee); to members, $3 greenhouse fee.*

March 6. Herbs in History and Legend. Herbals. Modern Books on Herbs and Herb Cookery. Miss Van Brunt.
March 13. Lecture: Planning the Herb Garden. Miss Van Brunt.
Greenhouse Work: Starting Herbs from Cuttings. Miss Dorward.
March 20. Lecture: Planting the Herb Garden. Miss Van Brunt.
Greenhouse Work: Starting Herbs from Seed Miss Dorward.
March 27. Cooking with Herbs. Practical Demonstrations with the Cooperation of the Brooklyn Union Gas Company.
April 3. Other Household Uses of Herbs. Aromatic Herbs. Herbal Therapy in House and Garden. Miss Van Brunt.
April 10. Lecture: Some American Herb Gardens. Miss Van Brunt.
Greenhouse Work: Potting up Rooted Cuttings; Pricking out Seedlings. Miss Dorward.

**A8. Trees in the Botanic Garden and Prospect Park.**—*Eight Mondays, 10:45 a.m. to 12, April 9 to May 28.* Outdoor meetings to study more than 100 species of trees, native and cultivated, including their economic uses and value in landscape art. *Fee to non-members, $2.50.* Dr. Graves, Dr. Gundersen.

***A9. Trees and Shrubs in Spring and Summer.**—*Ten Saturdays, 2:30 p.m., April 7 to June 9.* Outdoor lessons in the Botanic Garden and in the parks and woodlands of Greater New York. Similar to A5, except that the species are studied in their spring and summer conditions. First meeting at the Botanic Garden. *Fee to non-members, $3.* Dr. Graves, Mr. Doney.

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* See pp. 180, 186.

**A11. Wild Flowers and Ferns: Field Course.**—*Six Saturdays, 2:30 p.m., April 28 to June 2.* Trips in the Botanic Garden and in the woodlands near the City, for field identification of flowers and ferns of spring and early summer. *Fee to non-members, $2.* First meeting at the Botanic Garden. • Miss Rusk.

**A12. Wild Flowers in the Botanic Garden.**—*Eight Monday evenings, 6:30 to 8, April 23 to June 11.* Visits to the Wild Flower Garden of the Botanic Garden, where a large proportion of our most attractive native plants are growing. No rough walking. *Fee to non-members, $2.50.* Miss Rusk.

**A16. Native Ferns in the Botanic Garden.**—*Four Wednesday evenings, 6:30 to 7:30, May 9 to June 6 (omitting May 30).* Meetings in the Wild Flower Garden of the Brooklyn Botanic Garden, where about twenty-five of our native ferns are growing. Sure and easy ways of knowing these ferns are pointed out. No rough walking. (Similar to Fall Course A15, page 181.) *Fee to non-members, $1.* Miss Rusk.

**A28. The Small Vegetable and Flower Garden.**—*Five Wednesdays, 10:30 a.m., February 28 to March 28.* The preparation of soil, pruning of roses, raising of seedlings; greenhouse and practical work in pricking. Class limited to 45 persons. *Fee to non-members, $6 (including greenhouse fee); to members, $3 greenhouse fee.* Miss Shaw, Miss Dorward.

***A30. Ornamental Shrubs: Spring Course.**—*Ten Wednesdays, 11 a.m., April 11 to June 13.* Outdoor meetings on the grounds of the Botanic Garden. The principal flowering shrubs and small trees are considered at their times of flowering, emphasis being placed on their uses in plantings, their cultivation, and distinguishing characters. *Fee to non-members, $3.* Mr. Doney.

**A37. Lilacs in Flower.**—*Four Wednesdays, 4:15 to 5:30, May 2, 9, 16, and June 6, and one other day* to be arranged. Five outdoor lessons. The comprehensive collection of the Garden affords opportunity for the study of more than 100 kinds of lilacs. In the last lesson, culture and propagation are taken up; cuttings, which become the property of those taking the course, are prepared for rooting. *Fee to non-members, $2.*

Dr. Gundersen, Mr. Free, Miss Clarke.

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* See pp. 180, 186.

**A39. Flowers for your Garden.**—*Six Mondays, 3:30 p.m., April 16 to May 21.* Informal lectures and discussions on culture and the most suitable varieties of flowers for your garden, as follows: 1. April 16. Spring-flowering Bulbs. 2. April 23. Rock Garden Flowers. 3. April 30. Woodland Flowers. 4 and 5. May 7 and 14. Perennials. 6. May 21. Annuals. *Fee to non-members, $2.* Miss Clarke.

**A44. Gardens within a Garden.**—*Seven Tuesdays, 4 p.m., April 10 to May 29 (omitting May 8).* A series of trips in the Botanic Garden, designed especially for Members of the Garden and of the Institute, to enable them to become acquainted with the general plan of the Botanic Garden and the nature of the special gardens, as well as to see the various floral displays when they are at their best. The schedule of individual trips will be announced later. *No fee.* Dr. Graves and others.

**A48. The Vegetable Garden.**—*Five Fridays, 10:30 a.m., March 16 to April 13.* Lectures and demonstrations. Getting the most from a small plot by companion and succession cropping. Soil improvement and maintenance of fertility. Seed sowing, indoors and out; thinning; cultivating; harvesting and storing. *No fee.* Mr. Free, Miss Dorward.

**A49. The Vegetable Garden: Greenhouse and Lecture Course.**—*Six Thursdays, 10:30 a.m., March 15 to April 19.* Same as A48, with the addition of practical work in the greenhouse. Vegetables which are usually raised under glass are started by class members, who have the privilege of keeping the young plants thus raised. Largely seeing and doing. Limited to 50 persons. *Fee to non-members, $5 (including greenhouse fee); to members, $3 greenhouse fee.* Mr. Free.

## FLOWER DAYS

To afford an opportunity to members to see the various floral features of the Garden and the special outdoor collections when they are at their best, the following "Flower Days" have been observed, and will be held according to postcard announcements. Each event will be in charge of a specialist on the particular flower concerned.

| | |
|---|---|
| Apple and Cherry Blossom Day. | Dr. Reed. |
| Lilac Day. | Dr. Gundersen. |
| Iris Day. | Dr. Reed. |
| Wild Flower Garden Day. | Dr. Svenson. |
| Annual Rose Garden Day. | Mr. Free, Mr. Tilley. |
| Fall Rose Garden Day. | Mr. Free, Mr. Tilley. |
| Herb Garden Day. | Mr. Free. |
| Chrysanthemum Day. | Mr. Free. |

## B. Courses for Teachers

These courses have been accepted by the Board of Education of New York City for "in-service credit," one credit being granted for each 15 hours. Through an agreement with Long Island University, undergraduate credit for certain courses will be allowed toward fulfilling the requirements for a University degree, provided the admission requirements at the University and the laboratory requirements at the Botanic Garden have been fulfilled. Such courses are starred (*). By special arrangement with the institution concerned, these credits have also been used as undergraduate credits in other colleges and universities. Long Island University students desirous of electing any of these or of the other courses should notify Dean Tristram W. Metcalfe or Dr. Ralph H. Cheney, who will give the candidate a card entitling him to admission to the course. The student should present this card at the beginning of the first session of the course.

**B2. Plant Study.**—*Fifteen Thursdays, 4 p.m., beginning September 28.* The subjects covered are those laid down in the Science Syllabus for the seventh and eighth years, such as New Plants from Old, Parts of Plants Used for Food, Plants of Different Zones. Practical work in the greenhouse and laboratory, and on the grounds. Two credits. *Fee to non-members, $5; to members, $3 laboratory fee.*

Miss Shaw, Miss Hammond, Miss Carroll.

**B3. Plant Culture and Gardening.**—*Thirty Wednesdays, 4 p.m., beginning September 20.* Planned primarily for teachers. This course is especially recommended by the Board of Education. It consists, throughout fall, winter, and early spring, of greenhouse work, and later, outdoor instruction in starting a garden. Subjects covered are the taking up of plants, planting of such fall bulbs as are available, propagation by different methods, study of soils, how to plan the small vegetable garden, and the raising of flower seedlings. Limited to 60. Two credits. (No students admitted for a half-year of work. This is a year's course, and credit is not given until May, 1945.) *Fee to non-members, $10 (including greenhouse fee); to members, $5 greenhouse fee.* Miss Shaw, Miss Dorward.

**B5. Garden Practice.**—For teachers only. Offered as Nature-Garden Science, in conjunction with the Board of Education. For details see Board of Education Announcement of Courses. Mr. Marvin M. Brooks, Miss Shaw, Miss Miner, Miss Hammond.

**B7. Greenhouse Work.**—*Thirty Tuesdays, 4 p.m., beginning September 26.* Designed for those teachers who have completed B3 and who desire to continue study of indoor culture of plants. Lectures, demonstrations and practical greenhouse work on propagating and growing many different types of flowering and foliage house plants. Two credits. *Fee to non-members, $10 (including greenhouse fee); to members, $5 greenhouse fee.* Miss Dorward.

***B10. Wild Flowers and Ferns: Field and Laboratory Study.**—*Thirty Thursdays, 4:30 to 6:30 p.m., beginning September 21.* Same as course A18. See pp. 181, 182. Four credits. *Fee to non-members, $8 (including laboratory fee); to members, $3 laboratory fee.* Miss Rusk.

***B13–14. Trees and Shrubs of Greater New York.**—*Twenty Saturdays, 2:30 p.m., September 30 to December 2; and April 7 to June 9, 1945.* Two-hour sessions. A course of outdoor lessons in the Botanic Garden and in the parks and woodlands of Greater New York, the principal object being to learn to know the common trees and shrubs, both native and naturalized, of the eastern United States, which are well represented in this region. The species are considered in systematic order, in both winter and summer conditions, and the outstanding features pointed out by

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* See pp. 180, 186.

which they may most easily be recognized. First meeting at the Botanic Garden. Two credits. *Fee to non-members, $6.*
Dr. Graves, Mr. Doney.

## C. Children's Courses

More than thirty separate courses are given Saturday mornings for boys and girls from eight to nineteen years old in the spring, fall, and winter. Miss Shaw and Assistants.

**I. Fall Course.**—*Eight Saturday mornings, 9–11:15, October 28 to December 16.* Nature study on the grounds; plant propagation in the greenhouse, using stem and leaf cuttings; bulbs and corms; making of terrariums and dish gardens. Enrollment limited to 175. *Fee, fifteen cents for the course.*

**II. Winter Course.**—*Six Saturday mornings, 9–11:15, January 13 to February 17.* Children who have shown unusual ability are chosen from the fall group for early winter work. Group limited to 50. *No fee.*

**III. Spring Course.**—*Eight Saturday mornings, 9–11:15, February 24 to April 14.* Nature study and preparation for the outdoor garden, including studies of seed germination, seed sowing in the greenhouse, and the making of garden plans. Enrollment limited to 200. *Fee, fifteen cents for the course.*

**IV. Outdoor Garden Course.**—*Begins April 28.* The outdoor garden is open throughout the summer season, and time is arranged to fit in with children's vacation schedules. No child is assigned an outdoor garden who has not had the spring preparatory work. Group limited to 200 children. *Fee, twenty-five or thirty-five cents, depending on the size of the garden.*

## D. Courses for Special Groups

**D1. Medicinal Plants: A Course for Nurses-in-Training.**—To be arranged on request. Dr. Graves.

**D2–3. Trees and Shrubs: Spring and Fall Courses for Employees of the Park Department.**—To be arranged on request.
Dr. Graves, Mr. Doney.

**D4. Gardening: for Employees of the Park Department.**—To be arranged on request. Mr. Free.

## E. Investigation

### 1. *Graduate Work for University Credit*

By the terms of a cooperative agreement between New York University and the Brooklyn Botanic Garden, properly qualified graduate students may arrange to carry on investigations in botany at the Garden under the direction of members of the Garden Staff, who are also officers of instruction in the Graduate School of the University. The advantages of the library, laboratories, herbarium, and collections of living plants at the Garden are freely at the disposal of students registered at New York University for such work. Such properly enrolled graduate students are charged no additional fees by the Garden.

Research work in botany presupposes a knowledge of plants obtained from a study in field and laboratory. Prerequisites include college courses along such lines as morphology, physiology, taxonomy, and genetics. Bacteriology and mycology are special prerequisites for E6. For E8, plant pathology and basic training in forestry are also required.

**E6. Research in Mycology and Plant Pathology.** Dr. Reed.

**E8. Research in Forest Pathology.** Dr. Graves.

**E9. Research in the Systematic Botany of the Flowering Plants.** Dr. Svenson

**E10. Research in the Structure of Flowers.** Dr. Gundersen.

### 2. *Independent Investigation*

The facilities of the laboratories, conservatories, library, and herbarium are available to qualified investigators who wish to carry on independent researches in their chosen field of botany. By "qualified investigators" is meant those who have obtained the doctor's degree or have completed most of the requirements for the doctorate. The laboratories are open for such use only during the hours when the Laboratory Building is regularly open, viz. 9 a.m.–5 p.m. Mondays to Fridays; 9–12 a.m. Saturdays; except on holidays, when the building is closed. There is a charge of $25 per year, payable to the Botanic Garden.

## COOPERATION WITH LOCAL SCHOOLS

The Brooklyn Botanic Garden aims to cooperate in every practicable way with the public and private schools of Greater New York in all matters pertaining to the study of plants and closely related subjects.

Geography classes, as well as classes in nature study and botany, find the collection of useful plants in the Economic Plant House, the Local Flora Section, the Herb Garden, and also the Meridian Panel, the Armillary Sphere, and the Labeled Glacial Boulders, valuable adjuncts to their class work. Illustrated lectures at the Garden for geography classes may be arranged.

To visiting college classes in geology and physiography the Botanic Garden offers interesting material for a study of glaciation. Notable features are a portion of the Harbor Hill terminal moraine (Boulder Hill), the morainal pond (the "Lake"), the labeled glacial boulders, and the Flatbush outwash plain. See Guide No. 7, *"The Story of our Boulders: Glacial Geology of the Brooklyn Botanic Garden."*

**Talks at Secondary Schools and Colleges.**—Informal illustrated talks on various subjects of an advanced botanical nature are always gladly given at Secondary Schools and Colleges by members of the staff. Arrangements for such talks should be made with the *Curator of Public Instruction.*

**School Classes at the Garden.**—Public and private schools, both elementary and secondary, may arrange for classes to come to the Botanic Garden for illustrated lectures by members of the Garden staff, or for guided tours of instruction through the conservatories and outdoor plantations.

Visiting classes must be accompanied by their teachers, and notice of such visits should be sent at least one week in advance. Blank forms for this purpose are provided by the Garden. Lists of talks and trips offered will be sent on request: for Junior High and Elementary Schools address the *Curator of Elementary Instruction;* for High Schools, the *Curator of Public Instruction.*

**Seeds for School and Home Planting.**—Penny packets of flower and vegetable seeds are put up by the Botanic Garden for children's use. In the early spring, lists of these seeds, order blanks for teachers and pupils, and other information may be secured on application to the *Curator of Elementary Instruction.*

**Loan Sets of Lantern Slides.**—Sets of lantern slides have been prepared for loan to the schools. Each set is accompanied by a short lecture text of explanatory nature. In all cases these sets must be called for by a responsible school messenger and returned promptly in good condition. Address, by mail or telephone (MAin 2-4433), Mr. Frank Stoll, *Custodian.* The subjects now available are as follows. Other sets are in preparation.

1. Plant Life
2. Common Trees
3. Forestry
4. Soil Conservation
5. Conservation of Native Plants
6. Spring Wild Flowers
7. Summer Wild Flowers
8. Fall Wild Flowers
9. Ferns and Fern Allies

**Study and Loan Material for Elementary Schools.**—To the extent of its facilities, the Botanic Garden will provide, on request, various plants and materials for nature study. Requests from Elementary Schools should be made to Miss Elsie T. Hammond, and material should be called for at the Information Booth on the ground floor.

## Study and Loan Material for Colleges, High Schools, and Junior High Schools

The Botanic Garden is able to supply botanical material for study. Geraniums, coleus, tradescantia, bryophyllum, sedum, mimosa, and various fungi, liverworts and ferns may be available. Some material illustrating genetics may be furnished, for example, sorghum seeds for growing $F_2$ seedlings showing red and green seedling stem characters with three to one ratios; others giving normal green and albino seedlings; pea seeds of tall and dwarf strains. Cultures of molds and paramecia may be available. Specimens and mounts for exhibit are also available.

A small charge is made for the material supplied or loaned.

## BUREAU OF PUBLIC INFORMATION

Consultation and advice, and the facilities of the library and herbarium are freely at the service of members of the Botanic Garden and (to a limited extent) of others with special problems relating to plants or plant products, especially in the following subjects:

1. The care of trees, shrubs, and lawns.
2. The growing of cultivated plants and their arrangement; also their adaptation to soils, climate, and other factors.
3. Determination (naming) of flowering plants.
4. Plant diseases and determination of fungi.
5. Plant geography and ecology.

Inquiries should be directed to the *Curator of Public Instruction*, preferably by letter.

**Determination of Specimens.**—If the identification of plants is desired, the material submitted should include flowers, and fruit when obtainable. Identification of a single leaf is often impossible. For identification of plant diseases, representative portions of the part diseased should be sent.

## CONDUCTED TOURS

To assist members and others in visiting the plantations the services of a guide may be obtained. Arrangements should be made by application to the *Curator of Public Instruction* one week in advance. No parties of less than ten adults will be conducted. This service is free of charge to members and accompanying friends. For information concerning membership in the Botanic Garden see pages i to v of this PROSPECTUS.

## MEETINGS OF OUTSIDE ORGANIZATIONS

The Brooklyn Botanic Garden is glad to welcome outside organizations wishing to hold meetings at the Garden, provided the general purpose of the organization is closely allied to that of the Botanic Garden (e.g., Botanical Groups, Garden Clubs, Nature Study Clubs, Conservation Organizations, etc.), or that the specific purpose of the meeting is of mutual interest and advantage to the organization and the Botanic Garden. Meetings must always be arranged in advance. A folder giving full details, and an application blank may be had by addressing *The Custodian.*

## PLANTATIONS

The plant families are arranged in accordance with the Engler and Prantl system. In addition to this systematic arrangement, there are a number of special collections of horticultural varieties —azaleas, cannas, crocus, chrysanthemums, daffodils, ferns, flowering cherries, flowering crab apples, iris, ivies, lilacs, lotus, peonies, rhododendrons, and waterlilies. There are several specialized gardens, hence the popular designation "Gardens Within a Garden." These are:

Children's Garden
Herb Garden, including culinary and medicinal herbs, and Elizabethan Knot Gardens
Oriental Garden
Rock Garden
Rose Garden
Shakespeare Garden
Wall Garden
Wild Flower Garden (Local Flora Section)

## HERBARIA

*The Herbarium of Flowering Plants and Ferns* consists of approximately 220,000 sheets. Besides North American plants, there are especially good representations from Ecuador, Spain, and the South Sea Islands.

*The Cryptogamic Herbarium* contains approximately 81,000 specimens of fungi and myxomycetes.

*The Herbarium of the American Fern Society*, deposited at the Garden by an agreement executed on January 22, 1941, consists of approximately 6,000 sheets of ferns and fern allies.

These herbaria may be consulted daily (except Sundays and holidays) from 9 a.m. until 5 p.m.; Saturdays from 9 a.m. to 12 m. Specimens may be submitted for identification.

# LIBRARY

The rapidly growing library of the Garden comprises at present about 23,000 volumes and about 21,000 pamphlets. This is not a circulating library, but is open free for consultation to all persons daily (except Sundays and holidays) from 9 a.m. until 5 p.m. (Saturdays, 9 to 12). More than 1,000 periodicals and serial publications devoted to botany and closely related subjects are normally received. These include the transactions of scientific societies from all quarters of the globe; the bulletins, monographs, reports, and other publications of various departments of the United States Government, as well as those of foreign governments, and of all state agricultural experiment stations and agricultural colleges; the publications of research laboratories, universities, botanic gardens, and other scientific institutions of the world, as well as the files of independent journals devoted to the various phases of plant life. The library is specially rich in publications of foreign countries, and has a growing collection of incunabula and other pre-Linnaean works.

*The Library of the American Fern Society*, deposited at the Garden by an agreement executed on April 21, 1930, is also open free daily to the general public for reference, under the same regulations as govern the main library.

Bibliographical assistance is rendered to readers by members of the Library staff.

# THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES

**FOUNDED, 1824. REINCORPORATED, 1890**

ADRIAN VAN SINDEREN, *President.* EDWARD C. BLUM, *Chairman of the Board.*

## THE DEPARTMENT OF EDUCATION

**BROOKLYN ACADEMY OF MUSIC—30 LAFAYETTE AVENUE—STerling 3-6700**

## BROOKLYN BOTANIC GARDEN

**1000 WASHINGTON AVENUE—MAIn 2-4433**

## THE BROOKLYN MUSEUMS

**CENTRAL MUSEUM—EASTERN PARKWAY—NEvins 8-5000**
**CHILDREN'S MUSEUM—BROOKLYN AVENUE AND PARK PLACE —President 4-2900**

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## MEMBERSHIP

You are cordially invited to become a member of one or all of the Departments of the Brooklyn Institute. The annual fee in each Department is $10, carrying full privileges in the division of your choice and partial privileges in the other two. You may join at any time

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**THE DEPARTMENT OF EDUCATION** offers its members free admission to more than 300 events; lectures, concerts, motion pictures, young people's programs, field trips, etc. Also: reduced rates for special courses and programs.

MR. DONALD G C SINCLAIR, *Chairman, Governing Committee* JULIUS BLOOM, *Director.*

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**THE BOTANIC GARDEN** offers its members free admission to "Flower Days," Spring Inspection, field trips, and most classes of instruction. Also: guide services, privileges of library and herbarium, free publications, advice on all aspects of gardening, distribution of surplus plant material, and visiting membership privileges in the botanic gardens and museums of other cities.

MR PHILIP A. BENSON, *Chairman, Governing Committee.* DR GEORGE S AVERY, JR., *Director.*

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**THE MUSEUM** offers its members private views of exhibitions, admission to Museum courses, phonograph records and prints from its lending libraries, and docent services. Also: five Museum publications free of charge and other Museum publications at reduced prices.

SIDNEY W. DAVIDSON, *Chairman, Governing Committee.*
MRS. LAURANCE P. ROBERTS, *Director.* ALBERT N HENRICKSEN, *Assistant Director.*

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**THE BROOKLYN ACADEMY OF MUSIC** is owned and operated by the Brooklyn Institute. Its Opera House, Music Hall, and Ballroom may be rented for concerts, plays, lectures, school ceremonies, dances, and other events.

WILLIAM T. HUNTER, *Chairman, Building Committee.* HERBERT T. SWIN, *Building Superintendent.*

# PRIVILEGES OF MEMBERSHIP
# IN THE
# BROOKLYN BOTANIC GARDEN

The Brooklyn Botanic Garden renders a public service in its endeavor to advance a knowledge of plants, affording educational advantages, and carrying on fundamental investigations. Members of the Garden have the opportunity of furthering these aims.

Special membership privileges are also offered as follows:

1. Advice on the choice and care of ornamental trees, shrubs, and herbaceous plants, and the best ways to grow plants successfully, involving methods of culture, and control of insect and fungous pests
2. The naming of botanical specimens submitted for determination.
3. Periodical distribution of surplus ornamental plant material and seeds.
4. Invitations for self and friends to the Annual Spring Inspection, and to spring and fall "Flower Days"; cards of admission to all exhibitions and openings preceding the admission of the general public, and to receptions; admission of member and one guest to field trips and other scientific meetings under Garden auspices, at the Garden or elsewhere.
5. Services of a guide (by appointment) for self and party, when visiting the Garden.
6. Free tuition in all courses of instruction, except that in greenhouse and laboratory courses a small fee is charged to cover cost of materials, etc.
7. The Library and Herbarium are available for consultation.
8. Announcement cards concerning plants in bloom and the activities of the Garden are sent to members from time to time.
9. As part of its services, the Brooklyn Botanic Garden issues publications of general horticultural interest, and technical papers based upon the researches carried on at the Garden. Special *Guides* to the plantations and collections, *Leaflets* of popular information, and the quarterly *Record,* which includes the *Annual Report* of the Garden's activities, are sent free to members.
10. Membership privileges in other botanic gardens and museums outside of Greater New York are offered to our members when they are visiting other cities and on presentation of Brooklyn Botanic Garden membership card.

## CLUB MEMBERSHIPS

For many years the Botanic Garden has had the pleasure of cooperating in numerous ways with Garden Clubs, Women's Clubs, and other organizations of the Metropolitan area, and a plan has been adopted whereby such organizations may become definitely identified with the work of the Garden in promoting an interest in plant life and horticulture, as follows:

*Annual Memberships.*—Garden Clubs or other organizations may qualify as Annual Members of the Garden on election by the Board of Trustees and payment of the annual membership fee of Ten Dollars. Each annual member club may designate one of its officers or other member to receive such invitations, notices, and publications as go to individual annual members and to represent the club at all Botanic Garden functions, including "Flower Days" and the annual Spring Inspection in May.

The Club may also have the following privileges:

*a.* *The services of a Botanic Garden docent or guide* for a tour of the plantations or conservatories, followed by tea. No parties of less than ten adults will be conducted. Schedule for such events must be arranged in advance, at dates mutually convenient to the Botanic Garden and the Club.

*b.* *One lecture a year* by a member of the Garden staff. This may be either (1) a lecture given to the Garden Club at the Botanic Garden or (2) a lecture given at a place specified by the Garden Club. A list of speakers and subjects available in these two categories will be mailed on request.

Arrangements will be facilitated if the Club will, with each request, designate at least two names.

*c.* One member of the club is entitled annually to free tuition in courses of instruction for which tuition is charged to nonmembers. In greenhouse and laboratory courses a nominal fee is charged to cover cost of material.

*Sustaining Memberships.*—Any club or other organization may become a Sustaining Member of the Garden on election by the Board of Trustees and annual payment to the Garden of the sustaining membership fee of Twenty-five Dollars.

Sustaining membership clubs enjoy the full privileges of annual membership, not only in the Botanic Garden but also in the Brooklyn Museum and The Institute at the Academy of Music. They may designate three members who may receive free tuition in Botanic Garden courses of instruction for which tuition is charged to non-members. They are entitled each year to two lectures free, by a lecturer chosen from the Garden's list of lecturers.

## OUT-OF-TOWN MEMBERSHIP PRIVILEGES

In accordance with a cooperative arrangement with a number of other institutions and organizations, Brooklyn Botanic Garden members, when visiting other cities, may, on presentation of their Botanic Garden membership card at the office of the cooperating museum or organization, be accorded, without charge, the same privileges as are enjoyed by the members of that institution, including admission to exhibits and lectures, and invitation to social events. This does not include being enrolled on the mailing list for publications, and does not include free admission to the Philadelphia and Boston spring Flower Shows.

In reciprocation, the members of the cooperating units, when visiting the Metropolitan district of Greater New York, will be accorded full membership privileges at the Brooklyn Botanic Garden.

The cooperating units are as follows:

Academy of Natural Sciences, Philadelphia, Pa.
Berkshire Museum, Springfield, Mass.
Boston Society of Natural History, Boston, Mass.
Buffalo Museum of Science, Buffalo, N. Y.
California Academy of Sciences, San Francisco, Calif.
Carnegie Museum, Pittsburgh, Pa.
Charleston Museum, Charleston, S. C.
Chicago Natural History Museum, Chicago, Ill.
Cranbrook Institute of Science, Bloomfield Hills, Mich.
Everhart Museum of Natural History, Science and Art, Scranton, Pa.
Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
Los Angeles Museum, Los Angeles, Calif.
Massachusetts Horticultural Society, Boston, Mass.
Missouri Botanical Garden, St. Louis, Mo.
Newark Museum, Newark, N. J.
New York State Museum, Albany, N. Y.
Peabody Museum of Archaeology and Ethnology, Cambridge, Mass.
Pennsylvania Horticultural Society, Philadelphia, Pa.
Philadelphia Commercial Museum, Philadelphia, Pa.
Southwest Museum, Los Angeles, Calif.

## V

## CLASSES OF MEMBERSHIP

The Brooklyn Institute of Arts and Sciences is organized in three main departments: 1. The Department of Education. 2. The Museums. 3. The Botanic Garden.

Any of the following eight classes of membership may be taken out through the Botanic Garden:

| | | |
|---|---|---|
| 1. | Annual, by annual payment of ....... | $ 10 |
| 2. | Sustaining, by annual payment of .... | 25 |
| 3. | Contributing, by annual payment of .. | 100 |
| 4. | Life, by one payment of ............. | 500 |
| 5. | Permanent, by one payment of ....... | 2,500 |
| 6. | Donor, by one payment of ........... | 10,000 |
| 7. | Patron, by one payment of .......... | 25,000 |
| 8. | Benefactor, by one payment of ....... | 100,000 |

Sustaining members are annual members with full privileges in Departments one to three. Membership in classes two to eight carries full privileges in Departments one to three.

In addition to opportunities afforded to members of the Botanic Garden for public service through cooperating in its development, and helping to further its aims to advance and diffuse a knowledge and love of plants, to help preserve our native wild flowers, and to afford additional and much needed educational advantages in Brooklyn and Greater New York, members also enjoy the special privileges indicated on a preceding page.

Further information concerning membership may be had by addressing the Director, Brooklyn Botanic Garden, Brooklyn 25, N. Y., or by personal conference by appointment. Telephone, MAin 2-4433.

NOTE: ***Contributions to the Brooklyn Botanic Garden, through membership dues or otherwise, constitute proper deductions under the Federal and New York State Income Tax Laws.***

# FORMS OF BEQUEST TO THE BROOKLYN BOTANIC GARDEN

### Form of Bequest for General Purposes

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which said sum to be used exclusively for the educational and scientific work of the Brooklyn Botanic Garden.

### Form of Bequest for a Curatorship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, as an endowment for a curatorship in the Brooklyn Botanic Garden, the income from which sum to be used each year towards the payment of the salary of a curator in said Botanic Garden, to be known as the (here may be inserted the name of the donor or other person) curatorship.

### Form of Bequest for a Fellowship

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, the income from which sum to be used in the payment of a fellowship for advanced botanical investigation in the Brooklyn Botanic Garden, to be known as the ..............................................fellowship.

### Form of Bequest for other particular purposes designated by the testator

I hereby give, devise, and bequeath to The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y., the sum of..............Dollars, to be used (or the income from which to be used) for the Brooklyn Botanic Garden *

.......................................................................

.......................................................................

* The following additional purposes are suggested for which endowment is needed:

1. Botanical research.
2. Publishing the results of botanical research.
3. The endowment of special gardens and collections.
4. The Library.
5. The Herbarium.
6. Extending and enriching our work of public education.
7. The purchase and collecting of plants.
8. Popular botanical publication.
9. Illustrations for publications and lectures.
10. The beautifying of the grounds.

# THE BOTANIC GARDEN AND THE CITY

THE BROOKLYN BOTANIC GARDEN, established in 1910, is a Department of the Brooklyn Institute of Arts and Sciences. It is supported in part by municipal appropriations, and in part by private funds, including income from endowment, membership dues, and special contributions. Its articulation with the City is through the Department of Parks.

The City owns the land devoted to Garden purposes, builds, lights, and heats the buildings, and keeps them in repair, and includes in its annual tax budget an appropriation for other items of maintenance. One third of the cost of the present buildings (total cost, about $300,000), and other permanent improvements to a total of more than $281,000, has been met from private funds.

Appointments to all positions are made by the director of the Garden, with the approval of the Botanic Garden Governing Committee, and all authorized expenditures for maintenance are made in the name of the private organization, from funds advanced by the Institute, which, in turn, is reimbursed from time to time by the City, within the limits, and according to the terms of the annual Tax Budget appropriation. Certain salaries are paid, in whole or in part, from private funds.

All plants have been purchased with private funds since the Garden was established. In addition to this, it has been the practice of the Garden, from its beginning, to purchase with private funds all publications for the library, all specimens for the herbarium, all lantern slides and photographic material, and numerous other items. These collections, available without charge for public use, are the property of the Trustees.

The interest on One Million Dollars at the rate of 3.5 per cent, added to the present private funds income, would restore that income to the 1930 figure. The Director will be glad to give full information as to the uses for which such additional income is needed.

## REGULATIONS CONCERNING PHOTOGRAPHING, PAINTING, AND SKETCHING

1. No permit is required for photographing with a hand camera, or for sketching or painting without an easel on the Grounds or in the Conservatories.

2. Sketching and painting with an easel and the use of a camera with tripod are not allowed in the Oriental Garden, the Rose Garden, the Local Flora Section (Native Wild Flower Garden), nor the Conservatories at any time without a permit. No permits are given for use after 12 o'clock noon on Sundays and holidays.

3. Artists may not bring into the Botanic Garden chairs, stools, or anything to sit in or on.

4. Holders of permits must not set up tripod cameras nor easels in such a way as to involve injury to living plants or lawns, nor to cause an obstruction to traffic on paths or walks.

5. Application for permits should be made at the office of the Director, Laboratory Building, Room 302, or by mail (1000 Washington Avenue, Brooklyn 25), or by telephone (MAin 2-4433).

BROOKLYN BOTANIC GARDEN RECORD

VOL. XXXIII OCTOBER, 1944 NO. 4

# SUPPLEMENT TO THE THIRTY-THIRD ANNUAL REPORT OF THE BROOKLYN BOTANIC GARDEN

## JANUARY 1–JUNE 30, 1944

## REPORT OF THE DIRECTOR

TO THE BOTANIC GARDEN GOVERNING COMMITTEE:

I have the honor to present herewith a supplement to the thirty-third Annual Report. It covers the six months' period beginning January 1, and ending June 30, 1944, except for the financial report; the latter covers the entire fiscal year 1943–44. It is my hope that the next several reports, at least, will cover the fiscal years. It is on these that our accounting to the City of New York is based. Furthermore, most of our educational and related activities are on a fall-winter-spring schedule, all of which fit admirably into a July 1 to June 30 fiscal year report.

Future numbers of the RECORD will contain articles covering the field of Horticulture as well as reporting significant developments in the Botanic Garden.

The general program reported for the last half of 1943 was continued in the first half of 1944, including all phases of Victory Garden activities (see under Grounds), and cooperation with the C.D.V.O., radio talks, etc.

The following points are dealt with in the accompanying report:

Attendance
Work with Students
Materials for Schools
C. Stuart Gager Memorial Service and Special Days
Library
Herbarium
Grounds
Conservatories
Financial
Research and Related Activities of Curators and Resident Investigators

Respectfully submitted,
George S. Avery, Jr.
*Director*

**Attendance.** The attendance on the grounds for the six months period, January 1 to July 1, 1944, was 687,791.

**Work with Students.** In the horticultural courses, registration in children's classes, meeting on regular Saturday morning schedules, was well over 200. Registration in teachers' classes, on an advanced level, was 165. In addition, the visiting class attendance was over 24,000 and involved 550 special sessions.[1] Children's Gardens are mentioned briefly under "Grounds."

In eight different courses, ranging from "Relations of Plants to Mankind" to "Wild Flowers and Ferns," the total registration was 171.[2]

**Materials for Schools.** *From the report of Ellen Eddy Shaw, Curator of Elementary Instruction.* 90% of the Brooklyn schools availed themselves of the privilege of buying penny packets of seed; 60% of the Queens schools, and 50% of those in the Bronx. Brooklyn and Queens are the boroughs we concentrate on. The total number of packets distributed through the schools was 1,166,399. Fifty per cent of the filling of packets is done voluntarily by our children during the summer.

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[1] From the report of Ellen Eddy Shaw, Curator of Elementary Instruction.

[2] From the report of Arthur Harmount Graves, Curator of Public Instruction.

There were 91 requests for miscellaneous teaching materials, from 55 institutions, but the amount of material sent out tells little. It might be of interest to take one example. Two thousand three hundred thirty-six plants given away were used in classes totaling over 50,000 pupils, and more than that, the requests for this material sent the name and help of the Brooklyn Botanic Garden from Benjamin Franklin High School in Manhattan, to Newtown High School in Queens, to the Red Hook Housing Project through the C.D.V.O., to the Coney Island and Shore Road Hospitals in Brooklyn, and from elementary schools in the Bronx and Queens back to Brooklyn.

**C. Stuart Gager Memorial Service and Special Days.** The thirtieth annual Spring Inspection of the Garden was made the occasion of memorial exercises in honor of Dr. Gager, the Garden's first Director. An address of appreciation was delivered by Mr. John C. Wister, Director of the Arthur Hoyt Scott Horticultural Foundation. Miss Hilda Loines, Chairman of the Governing Committee of the Garden, presided. About 250 members and guests were present, and many were later conducted on a tour of the Garden by members of the staff. This meeting is reported in full in an earlier issue (RECORD 33 (2): 169–178. 1944).

The Seventeenth Annual Rose Garden Day occurred on June 6. Mr. Walter D. Brownell of Little Compton, R. I., spoke on "Garden rose betterment." This was followed by a tour of the Rose Garden led by Mr. Brownell, Mr. Free and Mr. Tilley. Tea was served in the Rotunda of the Laboratory Building, members of the Woman's Auxiliary acting as hostesses. About 100 members and guests attended, among them Mrs. Walter V. Cranford, co-donor of the Rose Garden, and her daughter, Miss Margaret Cranford.

**Library.** *From the Report of William E. Jordan, Librarian.* The collections at present comprise 45,425 pieces, of which number 23,288 are volumes and 22,137 are pamphlets, an increase of 69 volumes and 340 pamphlets, or 409 pieces. Volumes purchased totaled 36. Gifts were 14 volumes, 275 pamphlets, and 406 parts. The list of donors is included in Appendix I.

Loans to other institutions totaled 39 items; 1 item was borrowed for the use of our staff.

# FINANCIAL STATEMENT FOR THE FISCAL YEAR 1943–1944

## I. Private Funds Accounts

| *Permanent Funds (Restricted*[1]*)* | *Principal* | *Unexpended Balance of Income July 1, 1943* | *Income 1943–44* | *Expenditures 1943–44* | *Balance June 30, 1944* |
|---|---|---|---|---|---|
| 1. Endowment Fund | $ 55,238.67 | $ 276.10 | $ 1,932.68 | $ 2,208.78 | $ 0.00 |
| 2. Life Membership | 11,568.08 | 55.34 | 387.40 | 442.74 | 0.00 |
| 3. George C. Brackett | 560.89 | 7.56 | 19.60 | 24.23 | 2.93 |
| 4. Cary Library Fund | 2,248.71 | 39.45 | 78.68 | 113.83 | 4.30 |
| 5. Benjamin Stuart Gager | 15,180.91 | 359.05 | 531.32 | 286.22 | 604.15 |
| 6. Martha Woodward Stutzer | 10,913.34 | 84.70 | 382.97 | 373.34 | 94.23 |
| 7. Mary Bates Spalding | 2,974.64 | 149.56 | 104.08 | 0.00 | 253.64 |
| 8. Alfred T. White | 272,304.99 | 1,361.52 | 9,530.64 | 10,892.16 | 0.00 |
| 9. A. Augustus Healy Bequest | 10,809.60 | 54.05 | 378.32 | 432.37 | 0.00 |
| 10. Robert B. Woodward Bequest | 27,030.73 | 135.15 | 946.04 | 1,081.19 | 0.00 |
| 11. Endowment Increment Fund | 66,156.02 | 0.00 | 2,265.67 | 2,265.67 | 0.00 |
| 12. A. T. White Memorial Fund | 4,248.33 | 21.24 | 148.64 | 169.88 | 0.00 |
| 13. Brooklyn Institute Centennial | 32,336.03 | 161.68 | 1,131.76 | 1,293.44 | 0.00 |
| 14. John D. Rockefeller, Jr. | 265,062.22 | 1,325.31 | 9,277.16 | 9,056.27 | 1,546.20 |
| 15. Citizens Endowment | 269,191.38 | 1,345.95 | 9,421.68 | 9,197.35 | 1,570.28 |
| 16. Henry W. Healy Trust | 54,608.53 | 313.82 | 1,867.72 | 0.00 | 2,181.54 |
| 17. Mrs. H. C. Folger Fund | 1,005.29 | 52.49 | 35.20 | 35.00 | 52.69 |

## I. PRIVATE FUNDS ACCOUNTS (*Countinued*)

| | | | | | |
|---|---|---|---|---|---|
| 18. John W. Frothingham | 10,000.00 | 50.00 | 350.00 | 400.00 | 0.00 |
| 19. F. E. W. Fund | 250,000.00 | 1,250.00 | 8,750.00 | 10,000.00 | 0.00 |
| 20. Ellen Eddy Shaw Endowment | 24,576.17 | 1,214.93 | 853.71 | 270.75 | 1,797.89 |
| 21. Herbarium Endowment | 4,000.00 | 34.83 | 140.00 | 47.75 | 127.08 |
| 22. Public Instruction Endowment | 2,234.93 | 158.12 | 78.20 | 18.40 | 217.92 |
| Totals | $1,392,249.46 | $ 8,450.85 | $ 48,611.47 | $ 48,609.37 | $ 8,452.95 |
| *Special Accounts* (*Restricted*) | | | | | |
| 23. Ella Reussner Trust Income Account | | $ 0.00 | $ 2,076.78 | $ 1,564.31 | $ 512.47 |
| 24. Sustaining Membership | | 116.62 | 1,241.17 | 1,241.17 | 116.62 |
| 25. Annual Membership | | 930.83 | 3,295.48 | 2,044.65 | 2,181.66 |
| 26. Tuition and Sales | | 6,130.26 | 13,389.65 | 16,784.82 | 2,735.09 |
| 27. Collections Fund | | 2,427.49 | 1,684.27 | 3,785.76 | 326.00 |
| 28. Special Purposes | | 4,823.33 | 1,521.93 | 1,759.60 | 4,585.66 |
| 29. Plant Pathology Research | | 0.00 | 6,600.00 | 6,500.00 | 100.00 |
| 30. Special Contributions | | 9,028.79 | 62,783.27 | 55,503.84 | 16,308.22 |
| Totals | | $23,457.32 | $ 92,592.55 | $ 89,184.15 | $26,865.72 |
| Gross Totals | $1,392,249.46 | $31,908.17 | $141,204.02 | $137,793.52 | $35,318.67 |
| Deduct Inter-account transactions | | | 65,233.27 | 65,233.27 | |
| Grand Total | $1,392,249.46 | $31,908.17 | $ 75,970.75 | $ 72,560.25 | $35,318.67 |

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[1] To the educational and scientific work of the Garden.

**Herbarium.** *From the Report of Henry K. Svenson, Curator.* Loans and accessions of material are outlined in detail in Appendix 6.

**Grounds.** *From the report of Montague Free, Horticulturist.* The grounds have been maintained in reasonably good condition, thanks to the availability of a few women gardeners and high school boys during the summer months. The summer drought made it difficult to keep most things in good order, but tropical water lilies were the finest in many years.

## II. TAX BUDGET FOR THE FISCAL YEAR 1943–1944

| *Account* | *Appropriation July 1, 1943* | *Expenditures* | *Balance June 30, 1944* |
|---|---|---|---|
| *Personal Service* | | | |
| Salaries—Regular Employees | $65,325.00 | $63,784.90[1] | $ 0.10 |
| Wages—Temporary Employees | 23,696.00[1] | 25,236.00 | 0.00 |
| Total Personal Service | $89,021.00 | $89,020.90 | $ .10 |
| *Other than Personal Service* | | | |
| Office Supplies | $ 100.00 | $ 100.00 | $ 0.00 |
| Printed Stationery and Forms | 100.00 | 100.00 | 0.00 |
| Departmental Reports and Bulletins | 200.00 | 200.00 | 0.00 |
| Printing, Binding and Reproduction | 10.00 | 10.00 | 0.00 |
| Motor Vehicle Supplies | 100.00 | 71.96 | 28.04 |
| Laundry and Cleaning Supplies | 200.00 | 197.45 | 2.55 |
| Medical, Surgical and Laboratory Supplies | 100.00 | 100.00 | 0.00 |
| Household and Refrigerating Supplies | 50.00 | 50.00 | 0.00 |
| Fuel Supplies | 1,703.97 | 1,703.97 | 0.00 |
| Small Tools and Implements | 50.00 | 50.00 | 0.00 |
| Agricultural, Botanical and Animal Supplies | 1,800.00 | 1,799.09 | 0.91 |
| Other Operating and Maintenance Supplies | 50.00 | 50.00 | 0.00 |
| Construction Material | 1,200.00 | 1,200.00 | 0.00 |
| Postage | 35.00 | 35.00 | 0.00 |
| Telephone | 425.00 | 423.36 | 1.64 |
| Expressage and Deliveries | 10.00 | 10.00 | 0.00 |
| Carfares | 10.00 | 10.00 | 0.00 |
| Motor Vehicle Repairs | 25.00 | 25.00 | 0.00 |
| Repairs to Buildings and Structures | 350.00 | 350.00 | 0.00 |
| Repairs to Office and Other Operating Equipment | 50.00 | 49.70 | 0.30 |
| Total Supplies and Equipment | $ 6,568.97 | $ 6,535.53 | $33.44 |
| Grand Totals | $95,589.97 | $95,556.43 | $33.54 |

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[1] Does not include transfer of $1540.00 from Code 5442-001—"Personal Service Salaries" to Code 5443-007—"Personal Services—Wages."

### III. SUMMARY OF TOTAL MAINTENANCE BUDGET FOR THE FISCAL YEAR 1943–1944

| | *Personal Service* | *Other than Personal Service* |
|---|---|---|
| *Income* | | |
| Tax Budget | $ 89,021.00 | $ 6,568.97 |
| Private Funds | 71,812.06 | 36,066.86 |
| *Expenditure* | | |
| Tax Budget | 89,020.90 | 6,535.53 |
| Private Funds | 55,503.84 | 17,056.41 |
| Total Income | 160,833.06 | 42,635.83 |
| Total Expenditure | 144,524.74 | 23,591.94 |
| Balance | $ 16,308.32 | $19,043.89 |

Balance of $33.54 remaining from City Appropriations as of June 30, 1944, reverted to City of New York—"General Accrual Fund."

Respectfully submitted,
EDNA A. PALMITIER,
*Acting Secretary*

*Note:* The above "Financial Statement" is a transcript of Brooklyn Botanic Garden Accounts in the books of the Treasurer of the Brooklyn Institute of Arts and Sciences. The Treasurer's accounts are audited annually by a Public Accountant, and a separate audit of this "Financial Statement" is not made in order to save unnecessary expense.

EDWIN P. MAYNARD,
*Treasurer*

*From the report of Alfred Gundersen, Curator of Plants.* About 40 new species or varieties of plants were added to the outdoor collection. Among these were *Decumaria barbara, Danae racemosa,* and varieties of *Ilex crenata* and *Buddleia.* About 200 shrub labels were put out.

Victory gardening continues to attract considerable public interest, and Mr. Free states that the Demonstration Victory Gardens at the south end of the Esplanade were maintained as during the previous year. Eighteen thousand square feet of ground were made available for vegetable culture in the Experimental Field. These were divided into 20 plots 20 × 30 ft. and 15 plots 20 × 20 ft. which were tilled by 35 employees of the garden on their own time.

The Children's Gardens, although not Victory Gardens in the special way we now understand the term, were productive and gave gardening training to about 200 eight to fourteen year olds.

Miss Shaw reports that the plants for the Children's Gardens, as well as for many home Victory Gardens, were raised in connection with Saturday morning classes and adult classes. Thirty thousand plants were produced in these efforts.

**Conservatories.** *From the report of Dr. Gundersen.* During the winter a number of plants in the conservatories were identified and labeled and a new map was made of the plants in the large house. Small plants of the bread-fruit tree, durian, chaulmoogra tree and jute were added to our collections. The Araceae in the conservatories have been revised.

*From the report of Mr. Free.* Reorganization of conservatories started in 1943, and was continued during the first three months of 1944 by removal of the boulder "bridge" in the Economic House; also by building a stone wall and constructing planting space around the pool. Brick edging was constructed along the walks. House No. 1 was changed to include the Evolution exhibit, and its center bench was removed to accommodate tubbed plants used on occasion for decorating in the Laboratory Building. In House No. 2 the center bench was removed and the ground bed made to accommodate "planted out" aroids. The east bench was changed to more suitably display the Bromeliad collection on logs and tree stumps.

**Financial.** The list of gifts of funds, etc., supplements that which appeared in the RECORD, Vol. XXXIII, No. 1. Expenditures and income for the fiscal year 1943–44 may be found on pages 198 to 201.[1] See Appendix 1 for donors, etc.

## Research and Related Activities of Curators and Resident Investigators.

### EXCERPTS FROM REPORTS

RESEARCH ON DISEASE RESISTANCE IN CHESTNUTS (*from the Report of Arthur Harmount Graves*): About 150 of the 1943 pollinations produced good live seeds, and hybrid seedlings. Some of those from crosses of our best Japanese-American with native American stock, look very promising.

On the three principal plantations—on land belonging to the White Memorial Foundation at Litchfield, Conn., on land of Mr.

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[1] The irregular arrangement of the financial reports is due to the necessity of saving paper.

Archer Huntington at Redding Ridge, Conn., and on our Hamden plantation—there are in all about 1000 hybrids. At least a dozen of these have so far resisted inoculation tests with the blight fungus and seem, therefore, to be highly resistant; but only a few of them have the desired erect habit needed for a timber tree. These 12 trees are mainly crosses of Japanese-American stock with the Chinese chestnut and back crosses of Japanese-American with resistant Japanese stock. We continue to enjoy the cooperation of the Division of Forest Pathology of the Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture.

RESEARCH ON DISEASE RESISTANCE IN OATS (*from the Report of George M. Reed, Curator of Plant Pathology*): A new race of loose smut of oats has been discovered this season. This race has the capacity of infecting the oats variety Victoria, which has proved highly resistant to most known races of loose and covered smut, and has been used extensively in hybridization for the improvement of oats. Some promising selections from oats crosses involving the variety Victoria, have proved to be resistant, and in these cases the other parental variety originally used in crossing was resistant to this new race.

RESEARCH IN PLANT CLASSIFICATION (*from the Report of Henry K. Svenson*): During the spring of 1944 a monographic account was completed of the species of water fern (*Azolla*) in North and South America. The first part of this paper, illustrated by three plates of photographs and line drawings, is in press (see "publications"). *Azolla* may be seen in the pool which terminates the Botanic Garden brook in late summer. These small aquatic ferns are so numerous as to completely cover the surface of the water, and for this reason have been important as a means of mosquito extermination. Five species are represented in North and South America, especially in the tropics.

RESEARCH ON FERNS (*Ralph C. Benedict, Resident Investigator*): For Dr. Benedict's research and related activities, see the thirty-third Annual Report issued in January 1944.

RESEARCH ON DRUG PLANTS (*Ralph H. Cheney, Resident Investigator*): During the first six months of 1944, a survey was begun to determine the availability of drug plants in the nurseries of Rhode Island, Vermont, New Hampshire, and Maine. This investigation will complete the original problem of obtaining such information regarding the northeastern United States. A report on New Jersey, New York, Connecticut and Massachusetts was published in April 1944.

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## APPENDIX I

### GIFTS RECEIVED JULY 1, 1943–JUNE 30, 1944

### Collections Fund *

Battle Pass Chapter—D.A.R
Otto Ebel
Mrs. William Emerson
Mrs. R. M. Gunnison
Mrs. John E. Leech
Mrs. Whitney Merrill
Miss Mary S. Pullman
Bernard H. Smith
Woman of '76 Chapter N.S.D.A.R.
Frank Uthoff
Anonymous
Anonymous

Total amount contributed .......................................... $ 109.00

### C. Stuart Gager Memorial Fund

416 contributors .............................................. $8,869.50
(Complete list of names and amounts will be listed in the 1944–1945 Annual Report)

### Plant Pathology Research Fund

| | | |
|---|---|---|
| Anonymous | $1,500.00 | |
| Anonymous | 2,500.00 | |
| Coker's Pedigreed Seed Co. | 100.00 | $4,100.00 |

### Ellen Eddy Shaw Endowment Fund

| | |
|---|---|
| Dr. I. O. Becher | $ 5.00 |
| Mrs. Herman Blatt | 5.00 |
| Class B8—1944 | 10.00 |
| Mrs. Muriel A. Davey | 5.00 |
| Miss Anna Marie Gissel | 20.00 |
| George H. Greenwood | 5.00 |

* *Note:* Contributions to the Brooklyn Botanic Garden constitute proper deductions under the Federal Income Tax Law.

| | | |
|---|---|---|
| Miss Sadie Hecht—2 series F Bonds ($25.00 face value) | 37.50 | |
| Mrs. Anna Hoffer | 1.00 | |
| Mrs. Nathan Klee | 25.00 | |
| Mrs. R. H. Lees | 2.50 | |
| P.S. 208—Brooklyn | 10.00 | |
| Melvin Smalley | 5.00 | |
| John F. Struse, Jr. | 10.00 | $ 140.50 |

## Special Award

| | |
|---|---|
| Horticultural Society of New York | $ 5.00 |

## Special Gifts for Children's Work

| | |
|---|---|
| Mrs. Charles Perkins | $ 25.00 |

## Special Needs of the Garden

| | |
|---|---|
| Anonymous | $ 500.00 |

## Special Purposes Designated by Donors

| | | |
|---|---|---|
| Mrs. Charles A. Boehrer in memory of Charles A. Boehrer | $ 100.00 | |
| Goodman Family | 50.00 | |
| Anonymous | 500.00 | $ 650.00 |

## GIFTS RECEIVED JANUARY 1–JUNE 30, 1944

## Library

A total of 14 books, 275 pamphlets and 406 parts of publications in addition to 1 portrait and 15 miscellaneous items were received as gifts. A list of donors follows.

Prof. Delia Abbiatti
Agricultural Research Institute (Sudan)
Dr. H. H. Allan
American Spice Trade Association
Prof. Irving W. Bailey
Dr. Carleton R. Ball
Dr. R. H. Barnes
Mr. F. C. Bawden
Beechnut Packing Company
Lt. (j.g.) W. S. Benninghoff
Dr. George O. Burr
Prof. Harold Saxton Burr
California Academy of Sciences
Mr. Arturo Castiglioni
Dr. Ralph Holt Cheney
Mr. George L. Clarke
Dr. F. E. Clements
Dr. T. D. A. Cockerell
Dr. W. R. I. Cook

Corn Industries Research Foundation
Mr. Edward R. Dewey
Mr. Richard Dittman
Mr. Carl J. Drake
Mr. Everett E. Edwards
Dr. Orie Jacob Eigsti
Mr. N. R. Ellis
Mr. R. A. Fisher
Florida University. Library
Prof. W. P. Fraser
l'Abbe Alexandre Gagnon
Dr. T. H. Goodspeed
Mr. Richard H. Goodwin
Dr. Alfred Gundersen
Dr. S. C. Harland
Dr. Francis Harper
Dr. Constance E. Hartt
H. J. Heinz Company
Dr. L. R. Hesler
Mr. C. W. Hock
Hoffmann-LaRoche, Inc.
Dr. C. C. Hosseus
Imperial Chemical Industries
Dr. C. T. Ingold
Institute of Agriculture (Anand)
Instituto Botanico de Universidad Central (Ecuador)
Inter-American Institute of Agricultural Sciences
Dr. W. O. James
Mr. Charles F. Jenkins
Dr. O. E. Jennings
Mr. Deane B. Judd
Mr. B. Kassanis
Dr. Bostwick H. Ketchum
Dr. Robert W. Lamson
Hermano León
Mr. Burton E. Livingston
Dr. George L. McNew
Prof. Rogers McVaugh
Maine University. Library
Prof. L. A. Maynard
Metropolitan Museum of Art
Middle American Research Institute
Mr. Reid Moran
Mutual Orange Distributors
Dr. S. R. Narayana Rao
National Audubon Society
New York State College of Forestry
Miss Blanch Pennington
Dr. Henri Pittier
Dr. J. H. Priestley
Mr. Kenneth B. Raper
Resinous Products and Chemical Company
Prof. A. J. Riker
Dr. William J. Robbins
Dr. J. M. Roque
Santa Barbara Botanic Garden
Dr. George Sarton,
Dr. R. E. Schultes
Dr. Paul B. Sears
Miss Ellen Eddy Shaw
Dr. Kenneth M. Smith
Smithsonian Institution
Sociedad Mexicana "Amigos de las Orquideas"
Spencer Lens Company
E. R. Squibb & Sons
Prof. C. N. Stark
Dr. Morris Steggerda
Dr. F. J. Stevenson
Dr. Lewis H. Tiffany
Toronto University. Department of Botany
Dr. E. N. Transeau
Mr. Otto Treitel
United Fruit Company, Middle America Information Bureau
Prof. C. B. Van Niel
Dr. S. A. Waksman
Mr. David Wasserman
Dr. Paul Weatherwax
Dr. J. E. Weaver
Dr. E. T. Wherry
Mr. Alfred F. Whiting
Dr. L. R. Wilson
Wine Institute
Prof. C.-E. A. Winslow
Winthrop Chemical Company, Inc.
Wisconsin State Historical Society

## Department of Plants

### LIVING PLANTS

Bixby, Mr. C., Brooklyn, N. Y. 9 Dentaria diphylla.
Doney, Mr. C. F., Brooklyn, N. Y. 1 Sophora flavescens.
Flowerfield Bulb Farm, Flowerfield, L. I. 420 Cannas.
Jackson & Perkins Co., Newark, N. Y. 32 Roses, 10 Viola.
Libby, Mrs. F., Hollis, L. I. 1 Jasminum grandiflorum.
Mee, Mr. J., Brooklyn, N. Y. 3 Pyxidanthera barbulata, 3 Epigaea repens.
Parrella, Mr. A., N. Y., N. Y. 55 Dahlia tubers.
Slama, Mrs. M. Brooklyn, N. Y. 1 Ceratonia Siliqua.
Tricker, Wm., Inc., Saddle River, N. J. 69 Hardy Waterlilies in variety. 44 Tropical Waterlilies.
Wolfsohn, Sgt. C., Ft. Myers, Fla. 2 Cyrtopodium punctatum, 1 Encyclia tampense, 2 Epidendrum.
Wollny, Mr. W., Brooklyn, N. Y. 2 Nerine flexuosa.

### SEED PACKETS

Bernhardt, Capt. A. A., N. Y., N.Y. (21)
Birch, Mr. E. O., Short Hills, N. J. (1)
Kittridge, Miss E. M., Vergennes, Vt. (2)
Simmonds, Mr. D., Ithaca, N. Y.
Lily Committee, American Horticultural Society (6)

## Phanerogamic Herbarium

Cornman, Mrs. M. Alice, 25 miscellaneous specimens collected in Florida.
Kittredge, Miss E. M., 23 miscellaneous specimens collected in Vermont.
Runyon, Hon. Robert, 8 Eleocharis specimens collected in Texas.

## Cryptogamic Herbarium

Kittredge, Miss E. M., 47 miscellaneous specimens of Lichens and 6 miscellaneous specimens of Mosses.

## For the Department of Elementary Instruction

Dittman, Richard, One book for the Children's Clubroom Library.
Harmon Foundation, One Kodachrome motion picture reel on Victory Gardening.
Levine, Walter, Thirty-five photographs of tropical and semi-tropical fruits and blossoms for the Clubroom.
Perkins, Mrs. Charles E., $25.00 honorarium for work in the Children's Garden.
White, Miss Harriet H., Cotton bolls for use in classwork.

*Note:* Gifts of money from various sources have been added to the Funds of the Department and are included in the financial report.

## APPENDIX 2

### PUBLICATIONS BY THE BOTANIC GARDEN PERSONNEL JANUARY 1–JUNE 30, 1944

**Cheney, R. H.**

Variation in reproductive phenomena by caffeine. (Abstract.) *Proceedings Federation of Amer. Soc. for Exper. Biology,* vol. 3, no. 1, March, 1944.

Drug plant production in New York and adjacent states. *Medical Record* **157**: 218–220. April, 1944.

**Dorward, Margaret M.**

The children's greenhouse. *Educational series, Dept. of Elementary Instruction.* May.

**Free, Montague.**

Report of the Horticulturist for 1943. *Brooklyn Bot. Gard. Record* **33**: 24–25. January.

Grafting and making cuttings. Abstract of lecture. *Horticultural Society of New York. Monthly Bulletin* **15**: 21–23. February.

Four gardening articles in *The Home Garden* and 14 in the *New York Sun.*

**Graves, Arthur Harmount.**

Children at work. *Brooklyn Inst. Bull.* **47**$^{4}$: 32. January.

Botany. Revision service (for 1943). *Collier's National Encyclopedia.* New York. April.

Chestnut breeding work in 1943. *Brooklyn Bot. Gard. Record* **33**: 11–13. January.

Report of the Curator of Public Instruction for 1943. *Brooklyn Bot. Gard. Record* **33**: 15–19. January.

The retirement of Austin Foster Hawes, State Forester of Connecticut. *Hartford Courant,* Hartford, Conn. January.

What is Botany? *Brooklyn Inst. Bull.* **47**$^{5}$: 32. February.

Victory Garden Courses. *Brooklyn Inst. Bull.* **47**$^{6}$: 32. March.

Spring at the Garden. *Brooklyn Inst. Bull.* **47**$^{7}$: 32. April.

46 articles on events at the Brooklyn Botanic Garden, for metropolitan newspapers.
6 abstracts for *Biological Abstracts.*

**Graves, Arthur H. and George M. Reed.**

C. Stuart Gager. *Torrey Bot. Club Bull.* **71**: 193–198. May.

**Gundersen, Alfred.**

Flower Structure and the Classification of Dicotyledons. *Brooklyn Bot. Gard. Record* **33**: 14. Jan.
Report of the Curator of Plants for the Year 1943. *Brooklyn Bot. Gard. Record* **33**: 21–22. Jan.
Large Trees in Prospect Park. *Brooklyn Eagle.* April.
More Trees in Prospect Park. *Brooklyn Eagle.* June 20.
Review of *Lilacs for America* by John C. Wister. *The Monthly Bulletin of the Horticultural Society of New York* **15**: 22. March–April, 1944.

**Jordan, William E.**

Report on the Library for 1943. *Brooklyn Bot. Gard. Record* **33**: 26–27. January.
Variety in garden books makes library opportunity. [Editorial.] *Library Journal* **69**: 249. March 15.

**Reed, George M.**

Thirty-third annual report of the Brooklyn Botanic Garden: Report of the acting director. *Brooklyn Bot. Gard. Record* **33**: 1–9. January.
Plant Pathology. *Brooklyn Bot. Gard. Record* **33**: 9–11.

**Reed, George M. and Arthur H. Graves.**

C. Stuart Gager. *Torrey Bot. Club Bull.* **71**: 193–198. May.

**Shaw, Ellen Eddy.**

Annual report of the Curator of Elementary Instruction. *Brooklyn Bot. Gard. Record* **33**: 19–21. January.
Boys, girls and vegetables. *Forecast* **LX**: 24–27. March.

**Svenson, Henry K.**

Report of the Curator of the Herbarium for 1943. *Brooklyn Bot. Gard. Record* **33**: 23–24. January.

C. Stuart Gager. *Ecology* **25**: 1–2. January.

Review of "Shrubs of Michigan" by Cecil Billington. *Am. Fern Journ.* **34**: 63–64. April–June.

The New World Species of Azolla. *Am. Fern Journ.* **34**: 69–84 (in press).

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## APPENDIX 3

## TALKS, LECTURES, ADDRESSES, AND PAPERS GIVEN BY THE BOTANIC GARDEN PERSONNEL, JANUARY 1–JUNE 30, 1944

**By Elizabeth Clarke:**

Jan. 17. *House Plants.* Bay Ridge Garden Club.

Jan. 18. *House Plants.* Garden Group of Manhasset Woman's Club.

March 9. *Small Flower and Vegetable Garden.* Rockville Center Garden Club.

March 21. *From Seed to Harvest.* South Strathmore Garden Club.

April 7. *Victory Garden Forum.* Abraham & Straus Dept. Store.

April 11. *Flowers for Spring.* Castle Manor Garden Club.

April 25. *Summer Care of the Garden.* Namm's Dept. Store.

**By Charles F. Doney:**

April 3. *Fertilizers.* Brooklyn Heights Garden Club.

June 27. *Insect Pests of Woody Plants.* Strathmore Garden Club, Manhasset, L. I.

**By Margaret M. Dorward:**

6 talks on *Victory Gardens* before various organizations, at schools, and CDVO meetings.

**By Montague Free:**

January 19. *Grafting and how to make cuttings.* Horticultural Society of New York.

February 16. *Plant propagation.* Torrey Botanical Club meeting. At the Garden.

March 17. *Improving the soil in the victory garden.* Mass meeting of Teachers and Superintendents. At the Junior H. S. for the Deaf.

March 20. *Plant culture.* Federated Garden Clubs of New York. Hotel Roosevelt.

March 22. *Herbaceous borders.* New York Times and Federated Garden Clubs of New Jersey and New York. At Times Hall. (Sponsored by the Times—proceeds for the benefit of the Red Cross.)

March 28. *Victory gardens.* Kiwanis Club of Brooklyn.

April 10 and 11. *Demonstration planting of Victory Garden.* At the Garden.

April 11. *Seed sowing and planting.* Victory Garden Program at Namm's Store. Demonstration and lecture.

May 10. *Plants and People.* Advisory Council, Salvation Army. At the Garden.

May 18. *Victory Garden headaches.* C.D.V.O. Pershing Square.

June 21. *Flowers for your vegetable garden.* Garden Club of Darien.

June 26. *Plant clinic.* C.D.V.O. Pershing Square.

**By Arthur Harmount Graves:**

February 23. *The work of the Brooklyn Botanic Garden.* Triboro Hospital.

March 31. *Geology with special reference to the Brooklyn Botanic Garden.* Science Club of Erasmus High School. At the Garden.

April 7. *The work of the Brooklyn Botanic Garden.* Westwood Garden Club.

April 28. *Plants for plastics.* Stuyvesant High School Farm Club.

May 3. *Food plants of the world.* P.S. 23, Bronx.

May 10. *Trees and Arbor Day.* Brooklyn High School for Homemaking.

May 17. *The work of the Brooklyn Botanic Garden.* The Suwasset Garden Club of Port Jefferson, N. Y. At the Garden.

May 18. *The American chestnut tree.* Mrs. Gladys Gordon Fry's Bird and Tree Group. Montclair, N. J.

May 19. *Grafting.* Science Club of Erasmus High School.

June 14. *The Brooklyn Botanic Garden.* The Staten Island Garden Club. At the Garden.

**By Alfred Gundersen:**

May 8. *Lilacs.* New Canaan Garden Club.

**By Elsie Hammond:**

June 7. *Plants that have gone to war.* Lutheran Church of the Good Shepherd, Bellaire, N. Y.

**By Frances M. Miner:**

January 14. *The Children's Garden at the Brooklyn Botanic Garden.* National Victory Garden Institute, Savoy Plaza Hotel.

**By George M. Reed:**

March 31. *Cereals.* Biology Class, Stuyvesant High School. At the Garden.

**By Hester M. Rusk:**

April 4. *Edible wild plants.* Garden Club of the Oranges.

May 17. *Conservation of Wild Flowers.* Brooklyin High School for Homemaking.

**By Ellen Eddy Shaw:**

5 talks on *Victory Gardens.*

3 talks on *Children's Gardens.*

4 talks on *The Brooklyn Botanic Garden.*

6 speeches for special occasions.

**By Alys Sutcliffe:**

March 21. *Insect pests and diseases of the Victory Garden.* Abraham & Straus Garden Center.

**By Henry K. Svenson:**

January 11. *Birds of Ecuador.* Bird Club of Brooklyn.

February 16. *The Brooklyn Botanic Garden in kodachrome.* Torrey Botanical Club. At the Garden.

April 26. *South American markets.* Class in Home Economics, Pratt Institute.

May 10. *Ecuador and Peru (kodachromes).* Garden Club of Triboro Hospital.

May 16. *Northern New England (kodachromes).* Winter's Night Club. At the Garden.

**By L. Gordon Utter:**

10 talks on *The Victory Garden Program* before various organizations.

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## APPENDIX 4

### RADIO TALKS GIVEN JANUARY 1–JUNE 30, 1944

*From Station WNYC:*

| | | | |
|---|---|---|---|
| January | 7. | Native American Vegetables. | Miss Clarke |
| January | 21. | Plants Serving Soldiers at War. | Dr. Cheney |
| February | 4. | New Uses for Herbs. | Miss Van Brunt |
| February | 18. | Brighten Your Garden with Shrubs. | Mr. Doney |
| February | 21. | "Victory Gardening" on Mrs. Bussing's Program "War-Time Living." | Dr. Utter |
| March | 3. | Victory Gardening: Getting Ready. | Mr. Free |
| March | 17. | Flower Garden Mustards. | Miss Clarke |
| March | 31. | Children's Victory Gardens. | Miss Miner |
| April | 14. | *Leaflets three, let it be.* | Miss Rusk |
| April | 28. | The Flowers that Bloom in the Spring. | Miss Shaw |
| May | 12. | Plants for Plastics. | Dr. Graves |
| May | 18. | Victory Gardens. (Victory garden questions in connection with C. D. V. O. Pershing Square.) | Mr. Free |
| May | 26. | Summer Plans for the Victory Garden. | Dr. Utter |
| June | 9. | Rare Trees in the Brooklyn Botanic Garden. | Dr. Gundersen |
| June | 21. | Victory Gardens. | Miss Dorward |

*From Station WAFM:*

| | | | |
|---|---|---|---|
| February | 15. | "Victory Gardening" on Mrs. Bussing's Program "War-Time Living." | Dr. Utter |

*From Station W75NY:*

| | | | |
|---|---|---|---|
| April | 4. | Victory Gardens. | Mr. Free |

## APPENDIX 5

## STATISTICS RELATING TO LIVING PLANTS

## JANUARY–JUNE, 1944

| | *Species or Varieties* | *Plants* |
|---|---|---|
| *Living Plants Received:* | | |
| By collection | 4 | 293 |
| By exchange | 18 | 27 |
| By gift | 132 | 655 |
| By purchase | 78 | 696 |
| Total | 232 | 1,671 |

### Seed Exchange

| | |
|---|---|
| *Seed Packets Received:* | |
| By collection | |
| By exchange | 65 |
| By gift | 30 |
| By purchase | 245 |
| Total | 340 |
| *Seed Packets Distributed:* | |
| To members | |
| By exchange | 15 |
| By gift | 14 |
| Total | 29 |
| *Plants and Cuttings Distributed:* | |
| To members | |
| By exchange | 27 |
| By gift | 178 |
| Total | 205 |

# APPENDIX 6

## HERBARIUM ACCESSIONS AND DISTRIBUTION

### Phanerogamic Herbarium

*Accessions:*

*By Gift:*

| | *Sheets* | |
|---|---|---|
| Cornman, Mrs. M. Alice, Washington, D. C. | 25 | |
| Kittredge, Miss E. M., Rutland, Vt. | 23 | |
| Runyon, Hon. Robert, Brownsville, Texas | 8 | 56 |

*By Exchange:*

| | | |
|---|---|---|
| Bazuin, Mr. C. W., Grand Rapids, Mich. | 77 | |
| Gray Herbarium, Cambridge, Mass. | 58 | |
| León, Brother Hermano, Havana, Cuba | 1 | |
| Lepage, Rev. E., Rimouski, Quebec, Canada | 17 | |
| O'Neill, Rev. H., The Catholic University of America, Washington, D. C. | 2 | |
| Rosengurtt, Dr. B., Estacion Juan Jackson, Uruguay | 103 | |
| U. S. Forest Service, Washington, D. C. | 2 | |
| U. S. National Herbarium, Washington, D. C. | 25 | |
| Warner, Dr. S. R., Sam Houston State Teachers College, Huntsville, Texas | 69 | 354 |

*By Collection:*

| | | |
|---|---|---|
| Graves, Dr. A. H., Brooklyn Botanic Garden | 11 | 11 |
| | | 421 |

*Distribution:*

*By Exchange:*

| | | |
|---|---|---|
| O'Neill, Rev. H., The Catholic University of America, Washington, D. C | 16 | |
| Rosengurtt, Dr. B., Estacion Juan Jackson, Uruguay | 50 | 66 |
| | | 66 |

### Cryptogamic Herbarium

*Accessions:*

*By Gift:*

| | | |
|---|---|---|
| Kittredge, Miss E. M., Rutland, Vt. | 53 | 53 |

*By Exchange:*

| | |
|---|---|
| McFarland, Dr. Frank T., University of Kentucky, Lexington, Ky. | 51 fungi |

### HERBARIUM MATERIAL LOANED

| | *Sheets* |
|---|---|
| Shaver, Dr. J. M., George Peabody College for Teachers, Nashville, Tenn. | 13 |
| | 13 |

### HERBARIUM MATERIAL BORROWED FOR STUDY

| | |
|---|---|
| Chicago Natural History Museum, Chicago, Ill. | 3 |
| Gray Herbarium, Cambridge, Mass. | 136 |
| Johnson, Mr. H. L., South Meriden, Conn. | 24 |
| Kern, Dr. F. D., Pennsylvania State College, State College, Pa. | 1 |
| Mould, Mr. H. J., Brooklyn, N. Y. | 2 |
| Murphy, Dr. R. C., American Museum of Natural History, New York, N. Y. | 17 |
| New York Botanical Garden, Bronx Park, New York, N. Y. | 31 |
| Simmons, Mr. G. W., Bronx, N. Y. | 3 |
| U. S. Forest Service, Washington, D. C. | 2 |
| U. S. National Herbarium, Washington, D. C. | 110 |
| | 329 |

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## APPENDIX 7

## STATISTICAL REPORT ON THE LIBRARY ACCESSIONS

| | *Autograph Letters* | *Portraits* | *Volumes* | *Pamphlets* | *Parts (Including Periodicals)* |
|---|---|---|---|---|---|
| Exchange | 2 | 0 | 19 | 56 | 1,534 |
| Gift | 0 | 1 | 14 | 275 | 406 |
| Publication | 0 | 0 | 0 | 6 | 29 |
| Purchase | 0 | 0 | 36 | 3 | 418 |
| Total | 2 | 1 | 69 | 340 | 2,387 |

| | |
|---|---|
| Books, pamphlets, and serials catalogued | 857 |
| Total number of cards typewritten and filed | 1,024 |
| Torrey Botanical Club index cards filed making a total of 64746 | 889 |
| Number of users of the Library | 1,371 |

| | |
|---|---|
| Books lent to members of the staff | 854 |
| Reference questions | 204 |

### AMERICAN FERN SOCIETY COLLECTION

| | |
|---|---|
| Total number of volumes in American Fern Society Collection, June 30, 1944 | 62 |
| Total number of pamphlets | 327 |
| Number of parts added | 1 |

# APPENDIX 8

## REPORT OF PHOTOGRAPHIC WORK

| | | |
|---|---|---|
| Negatives on file December 31, 1943 | | 10,800 |
| Negatives accessioned Jan. 1–June 30, 1944 | | 100 |
| Total negatives on file June 30, 1944 | | 10,900 |
| Lantern slides on file Dec. 31, 1943 | | 7,225 |
| Lantern slides accessioned Jan. 1–June 30, 1944 | | 65 |
| Total lantern slides on file June 30, 1944 | | 7,290 |
| Prints on file Dec. 31, 1943 | | 10,800 |
| Prints made Jan. 1–June 30, 1944 | 624 | |
| Prints used or distributed | 524 | |
| Prints filed Jan. 1–June 30, 1944 | | 100 |
| Total prints on file, June 30, 1944 | | 10,900 |
| Enlargements made Jan. 1–June 30, 1944 | | 52 |
| Kodachromes made Jan. 1–June 30, 1944 | | 400 |

# APPENDIX 9

## SIGNS AND LABELS

Signs and labels were made by Mr. John McCallum as follows:

| | |
|---|---|
| Small galvanized labels for herbaceous beds and for Rose Garden | 154 |
| Large galvanized labels for herbaceous beds | 27 |
| Lead labels for woody plants | 66 |
| Tree labels (lead) | 47 |
| Wood labels for Roses, Iris, etc. | 164 |
| Wooden signs | 11 |
| Cardboard signs | 59 |
| Wooden hanging labels for trees and shrubs | 137 |
| Total | 665 |

Also numerous miscellaneous numbers and signs.

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| Total, as of December 31, 1944 | | 816 |

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